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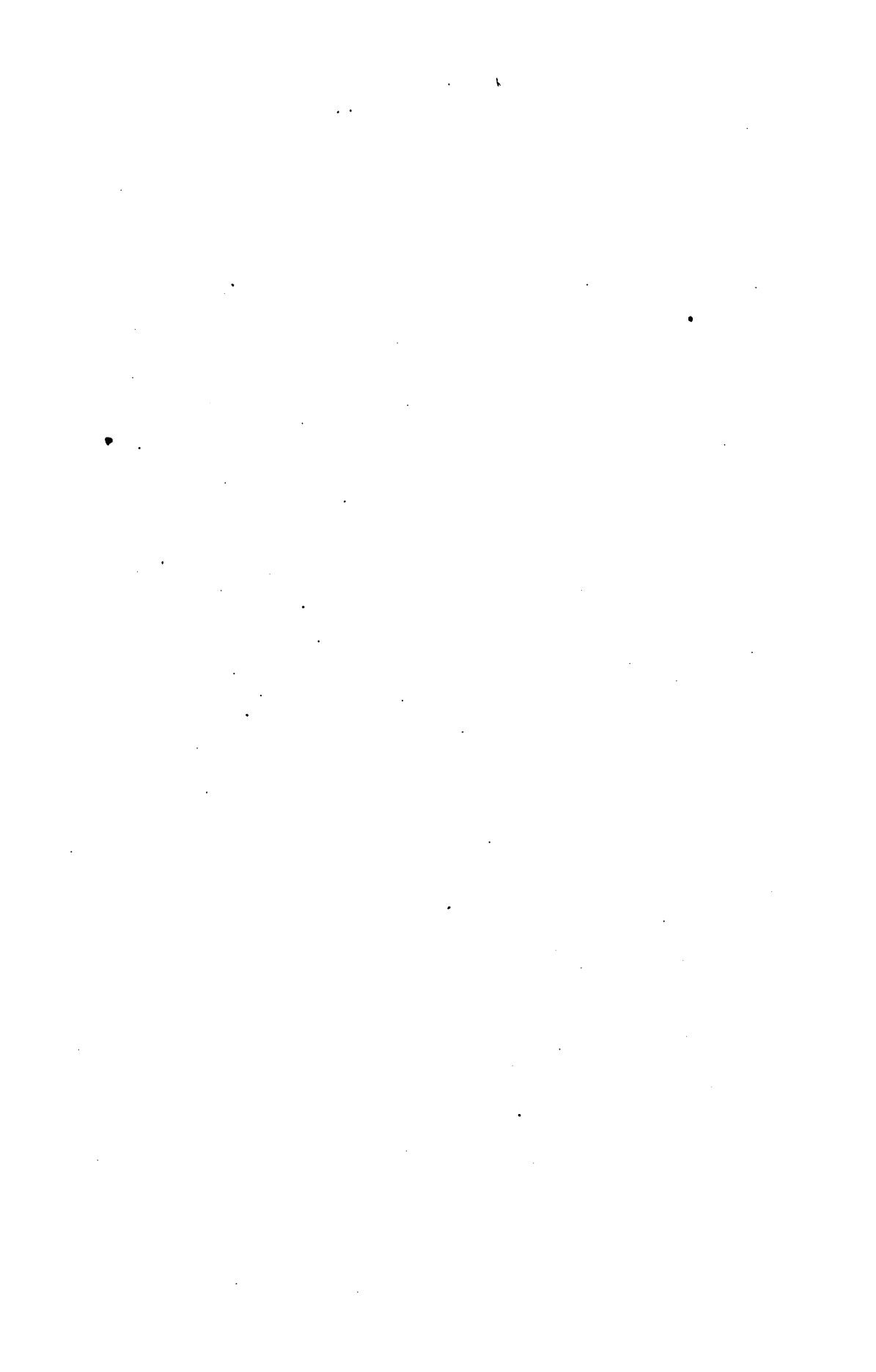
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HEARINGS

BEFORE THE COMMITTEE ON MINES AND MINING HELD
IN THE COMMITTEE ROOM OF THE HOUSE
OF REPRESENTATIVES

TO CONSIDER THE QUESTION OF THE ESTABLISHMENT OF A BUREAU OF MINES.

COMMITTEE:

JOSEPH HOWELL, Utah.	GEORGE F. HUFF, Pennsylvania, Chairman.
W. F. ENGLEBRIGHT, California.	GORDON LEE, Georgia.
JOSEPH W. FORDNEY, Michigan.	GEORGE A. BARTLETT, Nevada.
BURTON L. FRENCH, Idaho.	MARTIN D. FOSTER, Illinois.
JOSEPH G. BEALE, Pennsylvania.	THOMAS D. NICHOLLS, Pennsylvania.
ALBERT DOUGLAS, Ohio.	DANIEL W. HAMILTON, Iowa.
PHILO HALL, South Dakota.	WINFIELD S. HAMMOND, Minnesota.
CHARLES N. PRAY, Montana.	THOMAS CALE, Alaska.

MONDAY, MARCH 9, 1908.

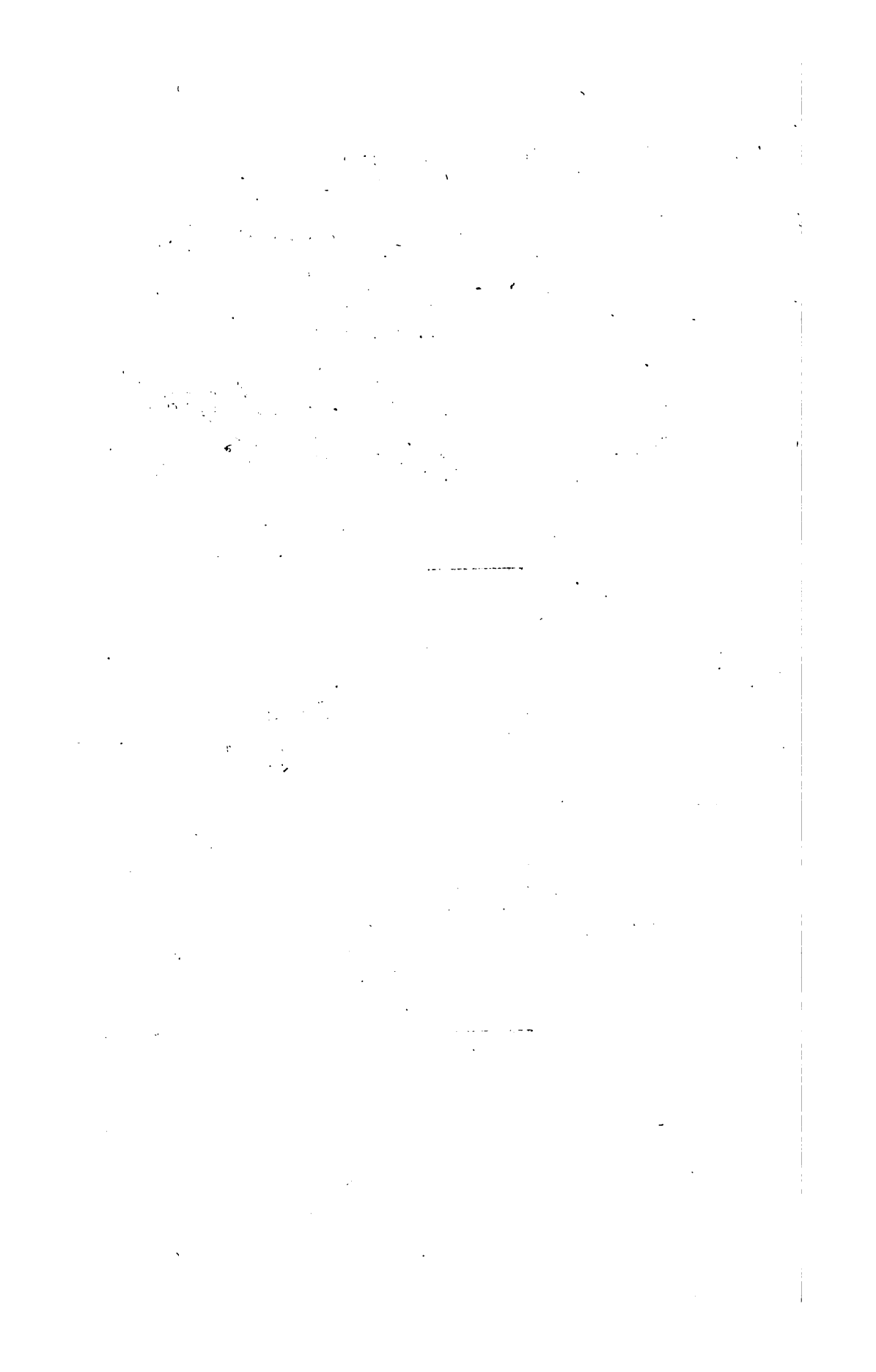
THURSDAY, MARCH 12, 1908.

MONDAY, MARCH 23, 1908.

MONDAY, MARCH 30, 1908.

WASHINGTON
GOVERNMENT PRINTING OFFICE

1908



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ESTABLISHMENT OF A BUREAU OF MINES.

MONDAY, *March 9, 1908.*

The meeting was called to order at 10.45 a. m. by Representative Englebright, chairman of the subcommittee having in charge the several bills bearing upon the creation of a Bureau of Mines.

Members present: Mr. Englebright (chairman), Messrs. Douglas, Hall, Hamilton, and Bartlett.

The following persons invited to be present: Prof. I. C. White, State geologist of West Virginia; Hon. A. B. Fleming, Fairmont Coal and Coke Company, Fairmont, W. Va.; Messrs. J. H. Walker, district president of the United Mine Workers of America, Springfield, Ill.; W. D. Van Horn, president of Indiana district, U. M. W. of A.; J. M. Craigo, president of West Virginia district, U. M. W. of A.; F. J. Drum, president Maryland district, U. M. W. of A.; James Purcell, of Clearfield, Pa., district president of the U. M. W. of A.; J. F. Callbreath, secretary American Mining Congress, Denver, Colo.; Representatives Wilson and Chaney.

Mr. Englebright stated the object of the hearing, as follows:

Gentlemen, during the present session of Congress there have been introduced a number of bills relative to the question of the establishment of a national department or bureau of mines, all with a view to providing the mining industries of the United States with a broad recognition by the Government deemed entirely commensurate with their importance, to the betterment of mining conditions generally in its several branches, and especially to the prevention of waste in mining methods and to the prevention of accidents which have recently proven so disastrous to life and property.

This subject has assumed such proportions and attracted such widespread earnest attention alike by the mine operators, mine workers, the public and press of the country, as well as by Congress itself, that it has been decided by the Committee on Mines and Mining of the House of Representatives to afford those interested every opportunity to present the different phases of the question for the information and guidance of those Members of the House of Representatives to whom these questions are referred for recommendation.

With this end in view, Mr. Huff, the chairman of the Committee on Mines and Mining has named Messrs. Douglas, Hall, Hamilton, Bartlett, and myself as members of a subcommittee to give particular consideration to this subject of a bureau of mines, and we have invited you gentlemen to be present that we may be better guided by your wide experience and advice as to what action by Congress may serve the mining industry to the greatest possible advantage. We desire that all who appear before this committee will feel free to speak frankly and fully, realizing that we must look to those experts who are best qualified in their respective lines of work to point the way to the proper solution of the matters under consideration. We will now be glad to hear from any of the gentlemen present.

Mr. DOUGLAS. I believe that we are united in the opinion that the bureau of mines should be established. I would be glad to listen to these hearings, but it seems to me that, this being true, it will be a waste of time to discuss the question as to whether we want a bureau of mines, but, rather, why?

Mr. WILSON. It is certainly pleasing to me to know that the committee has agreed upon the proposition for a bureau of mines. The statement of Mr. Douglas to that effect is very reassuring, and I assume that it voices the general opinion of those who have considered the matter.

Mr. DOUGLAS. I might add this, Mr. Wilson: We all held a meeting the other day and agreed that there is no question to which we could devote ourselves to more advantage.

Mr. WILSON. With that information, I will not go into an extended discussion. I believe that the necessity for it as bearing both on life and property is very fully set forth. I merely want to add that at a meeting of operators and miners from Pennsylvania, Ohio, Indiana, Illinois, and other important coal States, held at Indianapolis on the 27th, 28th, and 29th days of February, the question of a bureau of mines came up for consideration. I was secretary of that meeting. At that meeting the representatives of both interests jointly agreed that they favored a bureau of mining technology. While in the resolutions adopted the name of the particular bill or the number of the particular bill that they favored was not mentioned, it was generally understood that the ideas in favor were contained in the Chaney-Hemenway bill as the ideas in which the miners and operators mutually agreed. To that extent we are agreed and that the appropriation item offered by Senator Hemenway, amounting to \$200,000 should be made for the purpose of establishing and conducting this bureau. Beyond that we did not jointly take up any of the details of the proposed bureau of mines. As we understand the Chaney-Hemenway bill, it proposes a bureau of mining technology that will investigate into the mining technique, causes of explosions and other accidents, the loss and waste in mining coal, and other things of general welfare to the mining industry. But the convention prior to that one, in addition to the proposition for a bureau of mines, advocated and petitioned that an insurance or indemnity feature should be had, such as is contained in the McHenry bill. We are not agreed that it is constitutional, in the form that it can be used for the specific purpose; but the tax can be placed on the coal mined, for that purpose, and it is, in our opinion, just and proper.

Mr. HAMILTON. Do you believe that feature could be embodied in a separate bill and not in the bill that provides for the bureau?

Mr. WILSON. So far as I am personally concerned, I would not want to place anything in the way of establishing a bureau. I am speaking for myself alone. I do not want it to encumber or endanger the passage of a proper bill for the bureau. Speaking for my organization that I represent, they think that the two should be connected, and that there should be established a tax of 1 cent per ton on coal mined, to be used as an indemnity fund against the lives or injuries of the miners. They take that position. Attempts have been made at different times, laws have been passed in the different States, and immediately upon such measures being passed the operation of the mines has felt its disturbing influence. In the bituminous coal trade

it has not been so combined or so established that man can control it. Between West Virginia and Pennsylvania a few cents per ton tax passed on Pennsylvania or West Virginia coal would disturb the business. A tax of 3 cents per ton was proposed on coal in Indiana, and when that measure came before the State legislature we were engaged in making a wage contract. It led to trade disturbance and to withdrawal of the measure. I believe that the levying of such a tax on all coal will remove that cause of disturbance and place all of those interests in the same competitive position. The consumer would in the end assume the burdens which are incident to the production of that coal. In that we believe it is just. I want to state, however, that the operators did not agree with us to that extent in supporting that measure. I also want to make the statement in such a way that you may know where I stand. I want to see this tax levied, but if attaching it to a measure for the establishment of a bureau of mines will hurt that measure I do not care to see it attached. That is my personal position. But, speaking as a representative of the United Mine Workers of America, I desire to state that we favor such a tax and believe that it is just and proper.

Mr. ENGLEBRIGHT. Would that have to be levied as an internal-revenue tax?

Mr. WILSON. Yes; it would be an internal-revenue tax. As to the power to levy such a tax for a special purpose I am at present in doubt as to how it could be carried out constitutionally. It should further provide for a tax on all coal mined in the United States, Territories, and insular possessions at 1 cent per ton, and appropriations made to indemnify those who are killed or injured in the mines, such appropriations to be limited in amount to that accrued as the result of the tax.

Mr. ENGLEBRIGHT. Would you not just summarize your remarks to this extent: What objects do you believe that the bureau of mines should attempt for the coal industry to be able to assist them as they need assistance?

Mr. WILSON. My views are, first, that the bureau of mining should be provided and equipped with the necessary apparatus for making practical tests concerning the nature of gases; their effect when brought in connection with a flame or other material that may cause injury; the effect of dust, whether it will ignite and explode without an admixture of gas—carbureted hydrogen; whether the sprinkling of dry mines tends to increase or decrease the liability to explosions, and the intensity of them when they do occur; whether or not electricity in mines or electric wires carried into mines, insulated or un-insulated, tend to cause accidents in mines; whether or not silent current, a wire without a spark, would ignite gas or dust or other inflammable material, and whether or not the present explosives used in mining coal are the best that can be used, that can be devised, and all matters of that kind for the protection of life and limb, all of which are matters of doubt at the present time. It should further provide a tax on all coal mined in the United States, the Territories, or our insular possessions of 1 cent per ton, and make appropriations to indemnify those who are killed or injured in the mines, such appropriations to be limited to the amount that may be produced or secured as the result of the tax.

Mr. ENGLEBRIGHT. Would you consider it a very pertinent question to have the lights that are used in the mines still something that is very open to considerable discussion?

Mr. WILSON. Yes; I do. I consider that the question of lights is a very important question. Because of the fact of the safety lamps that are now in use being of such small candlepower, that candlepower itself being reduced as the result of going through wire gauze, and in addition to that the lamps being heavy and cumbersome, miners find them inconvenient to use, and they will frequently take risks rather than use them; also because of the fact that naked lights undoubtedly ignite gas when at the explosive point; and an investigation should be entered upon to determine whether or not those open lights would ignite dust under certain conditions and cause an explosion.

Mr. DOUGLAS. May I ask you this, whether or not you think that the language I read now covers your own views as to what should be investigated? Of course we can go, in a bill, into all the details that you speak of.

Mr. WILSON. I understand.

Mr. DOUGLAS. It reads: "To make an investigation of the methods of mining, the safety of miners, the possible improvement of conditions under which mining operations are carried on, the use of explosives and electricity, the prevention of accidents, the prices of products and markets for the same, the wages of employees, and of other matters pertinent to said industries."

Mr. WILSON. That, in my estimation, would cover it all. The last clause in itself is a blanket clause, and covers that which has not been specifically stated prior to that.

Mr. HALL. Just a moment, since you have answered that question. Did you examine all the details contained in this letter from the Secretary of the Interior to the Secretary of the Treasury, which is contained in House Document No. 523, containing an enumeration of different matters and items that it is recommended an appropriation be made for to purchase, in connection with these investigations?

Mr. WILSON. No; I have not examined it.

Mr. HALL. It is rather lengthy, and I just wanted to get your views as to the propriety of the expenditure for those purposes.

Mr. WILSON. While I have not examined this statement, I may state that I have discussed to some extent with others this general idea, as to the items that are necessary for the equipment. As to their accuracy I have no information.

Mr. HALL. It would be a matter of detail and experience, anyway?

Mr. WILSON. Yes, sir. But I do believe that there should be provided all of the necessary mechanical devices to make the tests that are required to demonstrate the correct theories, and perhaps in connection with the operations of mines.

Mr. HALL. One other question. I was not in the room at the time you made your remarks. You know that there are several bills here for the purpose of investigating the causes of these recent mining disasters?

Mr. WILSON. Yes.

Mr. HALL. Did you make any investigations in regard to them?

Mr. WILSON. I have not done so. I simply made the statement that so far as the miners and operators of western Pennsylvania—

their representatives in conference—Ohio, Indiana, and Illinois were concerned, we were a unit in agreeing upon the establishment of a bureau of mining technology such as is provided in the Hemenway and Chaney bills. To that extent we were a unit. Beyond that we had not considered the details of the proposition; but that the miners in separate convention had passed a resolution indorsing the principles embodied in the McHenry bill, and asking that it be changed to conform to the Constitution and enacted into law. The McHenry bill is somewhat lengthy. It provides for a bureau of mining, and in addition to a bureau of mining provides for a tax of 1 cent per ton.

Mr. HALL. I came in about the time you were discussing that.

Mr. WILSON. Yes. It provides for a tax of 1 cent per ton. I may say in addition to what I have already stated that miners also believe that in the establishment of a bureau of mining it would take some time to get the bureau into operation, to establish a bureau of the magnitude that would be required would take some time and to get it into practical operation. We believe that in the meantime an investigation should be proceeded with under the direction of the Secretary of the Interior, and that the means should be provided to proceed with that investigation. Any equipment that may be necessary or that may be secured to assist in that investigation would naturally be under the Interior Department, and would revert to the bureau of mining when it is ready to proceed with the work.

Mr. HALL. You think it would be better to have that under the auspices of the Secretary of the Interior than to have any of those commissions appointed that is provided in some of the bills?

Mr. WILSON. I do.

Mr. HALL. You think that would be better than to have an investigation made by this committee, by bringing witnesses before them?

Mr. WILSON. I do. My ideas of a commission are embodied in a joint resolution, I believe No. 100, which I introduced, and it proposes a commission of three lawyers, three expert mining engineers, three coal-mine operators, and three practical miners.

Mr. HAMMOND. That to be under the direction of the Secretary of the Interior?

Mr. WILSON. Yes, sir; to be under the direction of the Secretary of the Interior. The resolution so provides.

Mr. HALL. Why would it be better to have a commission of that kind to make the investigation under the auspices of the Secretary of the Interior than to have the witnesses brought before this committee who could give this information, excepting upon the question of actual experiments?

Mr. WILSON. Because of this, that the same parties who were examining the witnesses and giving theoretical knowledge would also be proceeding to secure the practical knowledge—the parties.

Your committee, I take it—the committee that is proposed under some of the resolutions—is to be composed of Senators and Representatives, and the sole purpose will be to examine witnesses, to get from those witnesses their ideas of the causes, and it would not be their province to make a practical demonstration by experiments.

Mr. HALL. I refer to the experiments, but what I was alluding to more particularly was the Huff resolution, which provides not for

the appointment of any commission at all, but that this committee might subpoena witnesses to come before them to give their testimony concerning causes of the mining disasters, and might also call before it expert witnesses who might make experiments in connection with the explosive proposition as to these gases, and the causes of the explosions, and so on, and to reduce that to writing, so as to constitute a permanent record.

Mr. WILSON. I do not think that is possible, because the devices that would be necessary to make practical experiments could not be produced and used in the short space of time, nor could they be readily movable. There are many devices that would be necessary for the demonstration of the cause of explosions of gas, the cause of the explosions of dust, if dust is one of the causes of explosions, and the power of powder explosions, and such experiments would scarcely be available before such a committee.

Mr. HALL. That apparatus you mention would probably require as much time for its preparation as would ensue before such department might be created as you recommend, anyway.

Mr. WILSON. Some of it.

Mr. HALL. Yes.

Mr. WILSON. Some of it. I am of the opinion that a permanent station will have to be established for experiments, and that permanent station will require considerable space and considerable apparatus to make the practical tests that will be necessary, and that permanent station necessarily should be established in the mining region, where it would be convenient for practical tests, such as the tests that are frequently made in the State of Pennsylvania, where the air in the mine is taken from the mine and taken to the inspectors' offices and there, by the use of the Shaw machine, analyzed.

Mr. HALL. So that whatever investigations were made prior to the establishment of this bill would necessarily have to be largely without the use of apparatus in any event, no matter what the proceeding there might be?

Mr. WILSON. There would be a great proportion of that that would have to be without the use of machinery; and yet the practical value of the investigations that might be made upon mines with the apparatus available—

Mr. DOUGLAS. I want to ask you a question there. Have you personally investigated the question of advisability, as to whether this bureau should be established in the Interior Department or the Department of Commerce and Labor; as a matter of law, I mean?

Mr. WILSON. Not as a matter of law, I have not. It has occurred to me, however, that it is interior work, and properly belongs in the Department of the Interior.

Mr. DOUGLAS. Because it has nothing to do with foreign affairs?

Mr. WILSON. Yes, sir; because it has nothing to do with foreign affairs.

Mr. DOUGLAS. But did you know, as a matter of fact, that the whole subject of mining, as an industry, is by the organic law creating the Department of Commerce and Labor put into that Department? Did you know that fact?

Mr. WILSON. No; I did not.

Mr. DOUGLAS. Well, that is true.

Mr. WILSON. That, however, as to which Department it should be assigned to, is not important.

Mr. DOUGLAS. It is going to be the important matter, the practical matter, in this whole business.

Mr. WILSON. Not in my mind.

Mr. DOUGLAS. I know, not to your mind, but before Congress. The Geological Survey is going after this work and trying to get it to develop their own importance. That is a thing you know.

Mr. WILSON. Well, the Geological Department, in my estimation, is the department to do this, whether the geological division is in the Interior Department, or whether the geological division is in the Department of Commerce and Labor. The Geological Department is the department which should handle this work.

Mr. DOUGLAS. Have you considered that question carefully, now?

Mr. WILSON. Not from the standpoint of a lawyer; not from the standpoint of legal technique.

Mr. DOUGLAS. No; but from the standpoint of practical success in getting a bill through Congress? That is what I am talking about. There is the thing to consider.

Mr. WILSON. No; unless there is some constitutional objection—

Mr. DOUGLAS. I will talk to you about it for two hours and a half some time.

Mr. WILSON. Yes. I can not see that it makes any material difference whether the bureau is in the Interior Department or whether it is in the Department of Commerce and Labor.

Mr. DOUGLAS. Yes; all right.

Mr. WILSON. So far as the management of these Departments are concerned, they will change with changing administrations.

Mr. DOUGLAS. Yes.

Mr. WILSON. So far as the conduct of them is concerned, they will change with the varying persons who are at the heads of the Departments.

Mr. DOUGLAS. Certainly.

Mr. WILSON. So that it makes practically, so far as the operation of the work is concerned, no difference to us whether it is in the Interior Department or in the Department of Commerce and Labor. There may be some political reasons that I do not know anything about. I am not bothering my head about political reasons as to why it should be this way or that way.

Mr. DOUGLAS. I had not any reference to political reasons; none at all.

Mr. WILSON. No; or as to whether one division in a Department is seeking to increase its power and prestige as against some other division in a department is a matter that makes no material difference to me.

Mr. DOUGLAS. It does make a difference to you, though, so far as the practical question of getting a bill through Congress is concerned.

Mr. WILSON. If there are any obstacles in the way—

Mr. DOUGLAS. Certainly.

Mr. WILSON (continuing). That I do not know of, that would prevent its going through in the Interior Department. I am perfectly

willing that it should be switched over to the Department of Commerce and Labor.

Mr. DOUGLAS. I think it should be there, and I have my reasons for it.

Mr. WILSON. Yes. I believe, however, that the Geological Department and the division—the bureau—of mines and mining should be together, and if the one is already in the Interior Department the other should go there, or else the Geological Department should be transferred also to the Department of Commerce and Labor.

Mr. ENGLEBRIGHT. We have with us this morning Mr. White, State geologist of West Virginia, who is here at my invitation, and I would be pleased to hear from Mr. White.

STATEMENT OF MR. I. C. WHITE, STATE GEOLOGIST OF WEST VIRGINIA.

Mr. ENGLEBRIGHT. Will you kindly state what connection you have had with mining and your present connection, so that the committee may recognize the force of any remarks you may make?

Mr. WHITE. I have been connected with the field geological surveys ever since 1875, thirty-odd years. I was for nine years on the Pennsylvania geological survey in the bituminous coal region, covering both the western end of the State and the eastern. I am the author of nine volumes, I think, of the reports of that survey. I am at present State geologist of West Virginia, and have also prepared a bulletin on the Appalachian coal field for the United States Geological Survey. I have also studied the coal fields of Brazil and have made an official report to the Brazilian Government on them. My work, while not in the practical line of operation, has led me to become familiar with all those questions that come up in the mining of coal. It has led me to observe one of the peculiar reasons why we need a bureau of this kind—namely, to prevent the enormous wastes that are constantly, daily and hourly, taking place in the mining of coal.

Of course you all understand that the abundance of coal, of cheap power, in the United States is the reason for its preeminence in the world of industry. That is what has made Pittsburg to-day the manufacturing center of the country, and it is what will keep the United States in the foreground of the industrial world as long as we can utilize our enormous resources. But, great as they are, they are exhaustible, and with the present rate of waste that is going on in every way our cheap power, instead of lasting for hundreds of years, as it should, will be largely exhausted within one hundred years, without any doubt, unless we can prevent this waste. Now, there are several methods of this waste that several of you have not seen or noticed, I have no doubt. First, there is the waste in the mining of the single seam. We had an illustration of that when the coal mining began in the Cumberland region. They had the same bed of coal there that has made Pittsburg the industrial center of the world, in what is known as the "Georges Creek field," and it was so thick—twice as thick as in the Pittsburg region—that the early operators found difficulty in taking it all out. It was from 12 to 15 feet thick, and they took out from 6 to 7 feet and left the rest, which

is there yet, hundreds of thousands of tons of the finest fuel in the world, one of our best fuels. That is one of the methods of waste.

Mr. DOUGLAS. Why can they not get it after a while?

Mr. WHITE. It is impossible ever to get that, because with the falling in of the roof it is broken up, and it would cost more than the coal is worth now. It could probably be taken out when coal goes up to \$10 and \$15 a ton, as it will in the not distant future, unless we preserve what we have got; but it is practically lost.

Mr. WILSON. Will the committee permit me to remark also that there would be very great danger to life and limb in taking it out.

Mr. WHITE. Yes. This roof has fallen in, and instead of a fissure every 10, 20, or 30 feet there are fissures and breaks every 2 or 3 feet, so that you would practically have to make a new roof, which would cost too much.

Mr. ENGLEBRIGHT. We have some mining in California that corresponds very nearly, or that is similar to some extent, to your coal mining, and that is our drift gravel mining. It is a very common thing to work in those mines 10 or 15 feet high, and each time things come down, and then we go to work and mine right over again. Had we not better send some of those California miners to show you how to do it?

Mr. WHITE. Of course gold is so much more valuable than coal that you might do it.

Mr. ENGLEBRIGHT. Yes; this runs in value from \$1 to \$2 a cubic yard.

Mr. WHITE. Coal, of course, has to be mined under commercial conditions, and while you may do that with gold I doubt if you can do it with coal. However, there are questions right there that this department could help to solve. For instance, in that connection, I have seen a bed of coal 150 feet thick in southern France, where they took a method of mining that we have never adopted here. They take off 385 feet of surface and mine it by stripping, and they find it cheaper. I think that this department can do a great deal in the line that you suggest, in bringing to light methods that they use in other parts of the world, in order to save all the coal. Now, the taking out only a part of the bed is one of the great methods of waste. That is where the coal is pure. Another loss comes in in this way. Not all of any coal bed, or at least rarely, if it is of any considerable thickness, is what is regarded at the time as commercial coal.

For instance, in this great Pittsburg bed, in the region of Pittsburg itself, it has from 3 to 4 feet of what is now regarded as not commercial coal in the roof, and formerly from 2 to 3 feet in the bottom. They simply took out the heart of it, from 4 to 4½ or 5 feet in the center, and all the rest is lost, just as half of that great seam in the Georges Creek basin was lost to them, although it was as good as what they took. But this waste is going on continually. A portion of the seam that is rich in hydrocarbons, but will not meet competitive commercial conditions under our present methods of utilizing coal, is left. There is where this bureau can do a great service for the coal industry itself and for the country by devising methods of utilizing the impure or bony coals that are frequently found both in

the roof and on the floor and sometimes right in the middle of the bed. From the Kanawha Valley, clear across to the Big Sandy, and going across into Kentucky, they have those splendid splint coals, none of them free from bony layers, which, while there is plenty of carbon in them, and they make plenty of power, will not meet commercial conditions, so that 2 or 3 feet of good coal has sometimes to be rejected. This bureau, by devising methods of utilizing those poor coals and bringing to the attention of the people, as the Geological Survey of the Government has done, how the coal can be utilized through the gas engine, and utilizing the power that way, will do work of great value, so that even these waste materials that we now regard as worthless, and throw away because they can not be sold at any price, will produce more power than even the best Pocahontas or Georges Creek or Cardiff coal when utilized through the steam engine. That is a vast waste in many regions; it is practically one-third of all the coal that is there. That is, that much is being left in the mines as being too impure to take out or rejected and piled up in the enormous heaps that you see around the mouths of very many mines. This bureau by its investigations and by the study of the scientific experts connected with it, by the invention of improved processes of manufacturing and using gas, would lead to the utilization of that waste.

Then there is another enormous waste in Pennsylvania and in Ohio and in Indiana and Illinois, Kentucky, and West Virginia, and all through the coal regions. There is not only one bed, but there are three, four, five, and even six beds.

Mr. CHANEY. There are seven beds of bituminous coal in Indiana.

Mr. WHITE. There is where we lack knowledge. Frequently the bottom seam is the best, and it will meet commercial conditions best. For instance, in my own State—West Virginia—we have mountains 1,750 feet high containing coal. I was over on the Clear Fork of Coal River, where the Big Coal Company has undertaken some developments; I think Mr. Jones, of Pittsburg, has undertaken some developments there. They have 75,000 acres there in one body, and there is a mountain 1,750 feet high which has coal from the bottom to the top, no less than eight workable seams, and yet they have started to mine only one. It is fortunate that it happens to be about one thousand feet above the level of the valley, but there are three other seams above this, and I have no doubt that the mining of this big seam, 10 to 12 feet in thickness, will ruin all those beds above. So here is something we need information about. It is suspected that the taking out of a thick seam of coal will so break up those seams that overlie, nearer the surface, that it will practically ruin all the rest above it. However, we do not know. It is suspected that that is the case. Of course so long as operators have no light on that question and it is not investigated from a scientific standpoint they will continue to do that, to their own injury. If they knew through the investigations of a bureau of this kind which could study it in every State in the Union and get data upon just what effect it has upon the overlying seams, taking out the coal below and letting the surface come down, what effect it has on those seams above, so that mine owners could act intelligently, you can see what a great saving it would be.

Mr. CHANEY. May I ask you if the scientific investigation and knowledge of the subject does not underlie the whole problem?

Mr. WHITE. Most certainly; because only a scientific bureau can study the question in Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Kentucky, Virginia, Alabama, and Tennessee, and other States outside of the Appalachian field, and reach definite conclusions.

Mr. DOUGLAS. Did you not begin your statement by saying that your experience had been a purely scientific one; that you knew very little about the technology of mining? What we are after is the industrial part of it, and you began your statement by saying that you knew the scientific part of it, but had not much experience in actual mining.

Mr. WHITE. Except as I have studied it.

Mr. DOUGLAS. But we want a bureau that knows the technology of it and the practical part of it.

Mr. WHITE. As a practical coal-mining engineer I do not pretend to have that kind of knowledge.

Mr. DOUGLAS. That is what that bureau is for. We have got the scientific thing now.

Mr. WHITE. Although necessarily I know something about it.

Mr. ENGLEBRIGHT. Do you know that there has been any investigation made as to the waste in the manufacture of coke?

Mr. WHITE. By the operatives themselves?

Mr. ENGLEBRIGHT. Yes.

Mr. WHITE. I think not. All that has been done has been done by the Geological Survey. And just there, I did not call attention to another source of waste. This Pittsburg region alone has wasted untold billions of the richest part of the seams by the methods of manufacturing coke, utilizing only about half. Practically the waste in making coke in the ordinary beehive oven with the volatile matter at 36 per cent is very great. What is oxidized and goes off in the burning is necessarily from 40 to 45 per cent of it, and the richest part of it. In the old countries you never see that. They save everything there. It is largely from lack of knowledge that they do it as they do here. The United States Steel Corporation is now considering the possibilities. They have investigated it from the scientific point of view, of not building any more beehive ovens, building their by-product ovens where their plants are, and they are now transporting the coal 400 miles from West Virginia, and mixing it with a coal higher in volatile matter, and making coke in that way. They have burned billions and trillions of gas in the Connellsville region in the last sixty years, or as long as they have been making coke. That is another possibility of work that this bureau could do, calling the attention of the country to the enormous waste that goes on in our present methods of manufacturing coke, so that there is a great deal to be done along that line. You never see a beehive oven in the old country. The commercial conditions appear to compel other methods, or else the laws compel them. This is another thing which these gentlemen can bring out and bring to the attention of the people. It is true in France, at least, that you are not permitted to make a hole in the ground without filling it up again. If you dig out rock, you have got to put rock back, especially if anybody has anything valuable there above it. On this coal bed at St. Etienne

in France they take off the whole surface. They had to buy the surface, and after they take out the coal they have to fill up the hole and level it off, so that they have good ground to build on.

Mr. ENGLEBRIGHT. Your suggestion is that there is ample room for this bureau to take up the question of the waste of material and the making of other products from the coal mines, and the better use of the material?

Mr. WHITE. Yes. Of course these other wastes go on in the mining of iron ore just as they do in the mining of coal. The inferior ores that will not meet the highest methods of the modern steel industry could possibly be utilized by a study which could be given them by a great bureau of the Government. So it does not apply only to the coal, but to practically every mineral we produce; and as to whether this bureau should be in the Department of the Interior or the Department of Commerce and Labor, that is a question for you gentlemen to decide. As a geologist, and one who has studied this question from the standpoint of the geologist, I should say the bureaus certainly should not be divorced. They should be together, wherever you place them. Whether you place both in the Interior Department or both in the Department of Commerce and Labor, you would make a great mistake if you divorced the two. If you put one in the Department of Commerce and Labor, you must bring the other there, too, or else you will have divided action, and the energies of the Department will be scattered instead of being concentrated.

Mr. HALL. In deciding the question of which Department it should be in connection with, what is your view as to whether it should be designed for the purpose of making scientific investigations or for the purpose of examining the question of mining from an industrial standpoint?

Mr. WHITE. I should say that the two go together. There is no industrial examination that is worth while unless it is founded and based upon previous scientific inquiries. All of our great discoveries have had for their basis scientific investigation. Not one, from telegraphy up to wireless telegraphy, that had not previously been worked out—the elements, the basis for it—in the laboratory, in purely scientific work. So that you can not divorce the two. They go together. Often, you know, the scientific man is derided. Professor Henry was arrested for a lunatic, up near Harrisburg, and against his vigorous protests was taken to the nearest asylum, because he was examining some rocks and collecting fossils. They offered a premium up there, as they do in some places, for those people, to bring them in, and two overanxious farmers, seeing a man doing an insane thing, thought of course he was a lunatic, and they took him by force of arms and led him up to the doors of the asylum.

Mr. HAMMOND. Would it be possible, do you think, for this work to be done by the Geological Bureau?

Mr. WHITE. Most certainly, because the Geological Survey is not only scientific in its nature, but intensely practical. I have mentioned some of their wonderful discoveries as to the utilization of these waste products in coal mines so that the slack and waste will produce more power when run through a gas burner than the best Pocahontas coal. Because a thing is scientific it does not follow that it is not practical; and even the practical men have learned that lesson, so that they have their men employed constantly who labor at

purely scientific problems; and that is one of the secrets of the success of the Germans. They have, at their great university, a corps of men trained in the highest degree in scientific inquiry, and that scientific work forms the basis of all their practical work, and you can not get away from it. You can not have anything that is practical industrially separated from its scientific basis.

MR. DOUGLAS. You do not want to go that far, that you can not have anything practical without that?

MR. WHITE. Yes, sir.

MR. DOUGLAS. How about the Sevres ware and the Dresden pottery? At their most successful times was there any scientific work connected with it?

MR. WHITE. Undoubtedly, underlying it, there was.

MR. DOUGLAS. Oh, no. I do not doubt that practical work and scientific work go together in this, particularly chemistry; but whether this work should be under one Department rather than under another is principally a matter of law, is it not?

MR. WHITE. Of course of that phase of it I know nothing; but as to divorcing the two, you would certainly make a great mistake if you did that, because they can not be divorced. All of our modern scientific discoveries have rested upon purely scientific work; we all know that.

MR. DOUGLAS. Do you think the Venetian glass makers knew anything about the scientific part of it?

MR. WHITE. Of course; they may not have called it scientific work, but it was of that nature.

MR. DOUGLAS. The greatest triumphs of the industrial world have been, at least in ancient times, without any reference to science whatever.

MR. WHITE. Even the old alchemists made discoveries, and they may not have called it science, but they were working on the lines that this modern scientific investigation is coming back to now, and doing it by scientific, systematic methods.

MR. DOUGLAS. Experiment and experience taught the Venetians how to make glass. They did not know anything about the science of it.

MR. ENGLEBRIGHT. We have with us ex-Governor Fleming, of West Virginia, who is prominent in connection with the management of coal mining, and we would be glad to hear from Mr. Fleming.

STATEMENT OF HON. A. B. FLEMING, OF WEST VIRGINIA.

MR. FLEMING. You asked Mr. White how he was connected with coal mining. I will state that my connection with it is in West Virginia. I am interested in and a director of the Clarksburg Fuel Company, Pittsburg and Fairmont Fuel Company, and the Southern Coal and Transportation Company. The coal mined by these companies—they are all working companies—is located in Harrison, Marion, Monongalia, and Barbour counties. The Fairmont Coal Company operates 30 mines—30 plants. The other companies operate two or three; the Southern Coal and Transportation Company only one. I scarcely know what you expect of me, but the accidents in the coal mines in our State and in some of the mines in which I am interested and the recent accidents also in the mines in Alabama

and Pennsylvania have stirred up the people wonderfully, not only operators and miners, but all the people, and the talk and the desire is for a department of mines and mining as we have always understood it in connection with the Interior Department. That has been discussed a great deal of late, and I have not heard of any person but is in favor of it. The cost would seem insignificant compared to the good that it will do in various ways, first in the safety of the mines, as we think; and the information which we would expect to derive from such a bureau would enable the operators to make the mines more safe, thus saving life and property. We have always supposed that the bureau would be one for the collecting of information which would be valuable for the operators, in enabling them to make the mines more safe, and still further to prevent a waste of coal, which has already been referred to here. I inquired of one of the largest operators in our State, well posted, a few days ago, how much coal he thought was wasted in the United States every year which might be saved by improved methods of mining, and he said 50,000,000 tons. I have talked to other persons since that, and they say that that is way under, and that it is very largely more than 50,000,000 tons. Now, that is a great deal of waste.

Mr. WHITE. That is way under the real amount.

Mr. FLEMING. I believe I was inquiring of you, and you said that it was near twice that?

Mr. WHITE. Yes.

Mr. FLEMING. And when we consider, as the old geologists said, that the nations that have iron and coal rule the world, we may appreciate the importance of making our iron and coal last. If we only have bituminous coal in this country enough to last a century or two centuries the way it is being used, and the use is going to increase as it has been increasing in the recent past, we can see the importance of lengthening out the time by economizing and preventing this waste. The loss of life in our mines, to say nothing of the loss of property and damages to operators, has been immense, and of course the most important thing, as I understand, is to make the mines more safe. I am interested, I am a director, in the Fairmount Coal Company which operated the two mines, Monongah 6 and 8, which blew up on the 6th of December, in which accident there were 356 people killed; the most deplorable accident, I believe, of which we have any record except the one in France a year or two ago. I think it is appropriate here to say that those mines were the safest and best mines, as we understood it, belonging to the Fairmount Coal Company, out of the 30 that we had. They were the newest, one opened two or three and the other eight to ten years ago, no expense was spared in the opening of them, in the laying of them out, or in the appliances and the machinery and ventilation, and everything else; nothing was omitted to be done that we knew of to make those mines the best and safest, and yet we had that accident.

Mr. CHANEY. Have you discovered what was the real trouble?

Mr. FLEMING. No, sir; that is what impressed upon us forcibly the importance of such a bureau as you are discussing here and contemplating creating. I do not think that it is possible for the States to do it. The States can not afford—thirty States, for instance—to create such a bureau as would be efficient and would be

able to determine what should be done to make the mines safer. Only the National Government, the Federal Government, can do it. The operators can not; they can no more do it than, nor as well as, the State, for various reasons. And I might say in this connection that the Fairmont Coal Company has its laboratory and a department of scientific work. Of course it is in a small way; but it is as good as we can get and can afford. We have a very fine chemist, Mr. Frank Haas, who has assistants there, and we have been doing all we could do, in a private way, to make our mines safe and ascertain what is necessary to make them safe, as I think Doctor White will confirm.

Mr. WHITE. Surely they are.

Mr. FLEMING. In connection with that I heard him say this morning he is one of the very best chemists in the United States.

Mr. WHITE. One of the very best; trained under Professor Lord, of the Ohio State University, one of the best coal chemists in the world.

Mr. FLEMING. He has been in those mines and has analyzed the air and the dust, and he is assistant general manager, so as to give him a right to direct. He knows where and how much gas is produced and controls it.

Mr. ENGLEBRIGHT. Have you any fear that the operators would fail to cooperate with the bureau of mines and mining on this proposition?

Mr. FLEMING. I have no doubt about it; and I would not regard the opinions of those who would refuse to cooperate with that bureau. I would say that the people who would not cooperate with a bureau like this established by the Government would not be worth considering for one moment.

Mr. ENGLEBRIGHT. Do you believe, Governor, that sufficient attention has been given in the past to the gases that have accumulated in the large tracts of worked-out ground?

Mr. FLEMING. Now, that is one thing that could be gone into by a bureau of this kind. We have tried to do that. Accidents are multiplying, loss of life is increasing, destruction of property has increased all over the country, in our State and in the neighboring States, we see that from newspaper accounts. That grows very largely, perhaps, out of the very suggestion you make, that they are working out areas of coal, large quantities of coal, and the mines are abandoned in certain places. Now, whether these places are safeguarded sufficiently is a question.

Mr. ENGLEBRIGHT. That is the question.

Mr. FLEMING. That is the question you put. We have supposed we were safeguarding them. In these mines I have referred to where these accidents occurred there were no abandoned places of any consequence, because the mines were new. If we had had those explosions in one of the older mines, where we are hauling coal from 3 to 5 miles, it would not have been so surprising, although it would have surprised us.

You asked if we knew the initial cause of the explosion. Doctor Holmes was there twice, making a personal investigation. Mr. Hall and his department remained there a week or two making investigation, and right while they were taking the dead bodies out and clearing up the mines that accident occurred down in Pennsylvania at the Darr mines, I believe, and these gentlemen alternated back

and forth. As I understand the Darr mine accident—I only speak from report—was from gas. The accident in our mines at Monongah could not have been the result of gas alone. The mines in that country generate more or less fire damp or gas, but the investigations of these mines showed that they were not considered in law gaseous mines. The inspector gave a certificate saying that they were not, and did not need to be worked with safety lamps, and after this explosion there was just a trace of gas found, not enough to explode even with the defects in ventilation, disturbed as it was. But our coal is dusty, and where the mines are dry there is more or less dust. The law requires that dust to be dampened, but it is very hard to dampen dust. We had an experiment made by our chemist showing that dust will not mix with water. Perhaps it will interest you for me to describe that experiment. The question was raised before the coroner's jury whether the mine was dampened, and our chemist before the jury took some mine dust and put it on top of water in a bowl, and then he stirred it until it all went down through the water and settled in the bottom of the bowl, and then he poured the water off in the presence of the coroner's jury and the water ran off clear, leaving the dust in the bowl, and then he blew with his breath a puff of that dust up several feet high, perfectly dry, flying in the air, after it had been stirred down through the water; so that you can not, as we understand, make a mine safe simply by wetting it. You can improve it. Now, an investigation such as can be made by a bureau, a scientific bureau, on those lines will be of great value.

Mr. WILSON. If you will permit me, I would like to ask you a question along the line suggested by the chairman.

Mr. FLEMING. Yes, sir.

Mr. WILSON. Is it not a fact that no method has yet been devised by which gas can be brushed out from old workings that have caved in?

Mr. FLEMING. Not unless you ventilate them.

Mr. WILSON. No method of ventilating has yet been devised?

Mr. FLEMING. Not when they abandon the mine. They do not generally undertake to take the gas out of the part of the mine that is abandoned. I do not see how they can get it out without keeping up the system of ventilation.

Mr. WILSON. The point I wanted to bring out is that no method has yet been discovered by which the gases can be brushed out from the broken, caved-in portions of old workings.

Another question. I am asking these questions for the purpose of bringing out information, you understand.

Mr. FLEMING. I understand, and I am glad to have any questions.

Mr. WILSON. Is it not a fact that the accumulations of gas in the old workings are more or less affected by the rise and fall of the barometer in going down and coming up from the active operations where the men are at work, or, in other words, that the rise and fall of the barometer has an effect on the gas in the workings?

Mr. ENGLEBRIGHT. That is a question of temperature.

Mr. FLEMING. Yes; that may be a question of temperature.

Mr. WILSON. What I wanted to bring out was that there is no method of getting these dangerous accumulations of gas out from old workings that have caved in. They can be gotten out of old

workings that have not caved in, but not from old workings that have caved in, and that is a source of danger; and this bureau, if established, might, by its experiments, determine some method by which the gas could be gotten out.

Mr. FLEMING. Yes; the gas that comes into the mines from the old workings into the new. Sometimes you strike a pocket that is very fresh in the new mines. That is taken out by the ventilation of the mine. Our idea has always been that a mine ought to be made safe enough with ventilation—even a gaseous mine—so that there is no danger even in working with an open light. We have the men use safety lamps because the law requires it; but we find that a mine is safer, unless it is a very, very gaseous mine, where they undertake to make it safe with ventilation; because when you use safety lamps a man may light his pipe, or in some way start a fire, relying on the safety lamp rather than on the ventilation. Where a mine is made absolutely safe by ventilation there is not much use in safety lamps. In these Monongah mines that blew up we did not use safety lamps. There was no need of it. There was no gas there in dangerous quantities, and we did not know, and do not know now, the conditions under which dust will explode from a lamp or from an open light. That is one thing, perhaps, that ought to be discovered, if it can be. Nor do we know what admixture of a small quantity of gas with the dust will become explosive and will explode.

Mr. CHANEY. Or to determine just how and when that mixture takes place?

Mr. FLEMING. Yes; that is a point for you gentlemen. That is one thing to be determined by scientific investigation, which is very important.

You asked me what caused that explosion. I have been getting away from it from time to time. There have been several theories. There were very careful investigations made by experts of the mining department from Ohio. Every superintendent was there, and there were several from Pennsylvania and several from Maryland, and they all made an examination. Some thought that the cause of the initial explosion was a runaway trip that caused a short circuit, and that was the first theory, but it was incorrect, because it was shown that the trip broke loose after the initial explosion had started. It ran into the mine after the explosion started. It came, undoubtedly, from a blown-out shot or loose powder. You gentlemen know what a blown-out shot is, undoubtedly, and that is one of the very dangerous things in mining. The miners are only allowed to carry 5 pounds each. The conclusion seemed to be in the end, there were some powder cans found, and right near a blown-out shot, and right there seemed to be where the heat started, which nobody lives to tell. Then the fire from the explosion of powder or from the blown-out shot, whichever it was, ignited whatever there was there to be ignited, some dust in suspension, or whatever gases were there, too little to be dangerous by themselves.

Mr. HALL. What is a blown-out shot?

Mr. FLEMING. In all regions that I know of, at least, there is an undercut, either with machines or with a pick, and maybe a side cut, and they drill a hole in the coal above that and put powder in and a fuse and blow the coal down—blow a good many tons down. The

powder is tamped into the hole with coal or with clay. Of course if there is a blown-out shot it will blow that out, and that makes a lot of dust to ignite, if it is tamped with coal. If it was tamped with clay, it would not make so much. Now, a blown-out shot is a shot that does not blow the coal down, but it will create a streak of fire 25 or 50 feet long.

Mr. HALL. It blows the tamping out?

Mr. FLEMING. It blows the tamping out, and there is a great deal of heat, and if there is loose coal it creates considerable dust, and if there is any gas in the dust or in the mine, however little, of course it accelerates the explosion. Now, whether this was a blown-out shot or an explosion of powder, the heat was very great, and it generated—manufactured—gas there in enormous quantities; millions of feet, our chemist calculates. The coal was coked for three-quarters of an inch deep in the solid. Just think of a heat that will coke coal three-quarters of an inch deep in the solid.

Mr. WHITE. That was on the face of the coal.

Mr. FLEMING. In the solid. And of course it coked and burned whatever loose coal and dust there was. The gas that was generated from the coal that was lying around and from the dust and from the coal in the solid that was burned made an immense amount, millions of feet, of manufactured gas, all of which exploded. It was just as explosive as the natural gas; and those explosions leaped successively from place to place, until the whole mine was covered and involved, going in different directions.

Mr. CHANEY. It would go in all directions, naturally, from the original heat.

Mr. FLEMING. Yes. It would miss some places, occasionally.

Mr. ENGLEBRIGHT. And then catch?

Mr. FLEMING. Yes; and then catch up again.

Mr. ENGLEBRIGHT. What was it you wanted to say as to the question of powder?

Mr. FLEMING. Oh, yes. Up to that time we used black powder, but since that we have used in all the mines where there seemed to be any gas, and the driest coal, what they call "flameless powder," masurite powder, and we think it is safer, and we forbid the men to tamp with coal, and require them to tamp with clay. It is very hard to make them do what you tell them to, however. Then we have shot firers, and wherever it is required, in the worst mines, we do not allow the men to do their own shooting. A shooter goes to a hole drilled by the miner, and if it is drilled in the solid, trying to blow down coal that ought to be undercut, the shot firer condemns that hole and does not put a shot in it, and the man loses that hole and has to drill another.

Now, gentlemen, I think that the explanation I have given you of that worst disaster, and you can inquire anything else about it if you like, shows the importance of investigations that have never been made and that we can not make. We have made all that we can make.

Mr. CHANEY. Is it worth while to put this investigating bureau into the Geological Survey?

Mr. ENGLEBRIGHT. Or to have a separate bureau of it?

Mr. FLEMING. I have always supposed it would be a separate bureau. That is a matter of detail that you gentlemen are more fa-

miliar with than I am. I supposed that the geological department works side by side with the division of mines and mining.

Mr. CHANEY. And they would cooperate with the regular Geological Service?

Mr. FLEMING. I should think they would. It would be more effective, however, if it was a separate department.

Mr. CHANEY. Do you mean to say that a bureau of mines and mining would be useful without being in connection with the Geological Survey?

Mr. FLEMING. Well, I suppose they would work together; yes, sir. This bill seems to contemplate a separate department, does it not?

Mr. CHANEY. Have you my bill there?

Mr. FLEMING. Yes, sir. Is that a separate department?

Mr. CHANEY. It is a separate bureau.

Mr. FLEMING. It is a separate bureau?

Mr. CHANEY. But in the Geological Survey branch of the work.

Mr. FLEMING. I took it that it was in the same department, but a separate bureau. That is my idea of it.

Mr. CHANEY. It is a separate bureau in the same department.

Mr. FLEMING. That occurs to me to be the thing that you want.

Mr. CHANEY. Here arises the proposition made by another bill introduced.

Mr. FLEMING. I have not seen that.

Mr. CHANEY. That this ought to go into the Department of Commerce and Labor, entirely disconnected with the Geological Survey office.

Mr. DOUGLAS. But do you know that the organic law of that Department puts it there?

Mr. CHANEY. No, I did not know that.

Mr. FLEMING. Those are things I do not know about. I just took it for granted that it would be a separate department.

Mr. DOUGLAS. If you have read the law, you know that the first thing that is put under the Department of Commerce and Labor is the matter of mining.

Mr. FLEMING. I have not heard any person, I believe, discuss the matter with a view of its going into the Department of Labor.

Mr. DOUGLAS. We all agree on the necessity of having a bureau of mines and mining somewhere; the question is where it should go, and the possibility of getting it through Congress is the thing doubtful.

Mr. FLEMING. It seems to me this is a matter that should be taken hold of by the Federal Government, and not left to the States and operators. I have endeavored to show that the operators can not do it. There are too many of them. It would require too many plants. There is too much scientific investigation to be made for operators to do it. The States can not do it; they will not do it right, and they would not undertake it, perhaps, and if they did there would be 30 or 40 of them getting out conflicting reports and recommendations, while all operators, I think, would be willing to follow and carry out the recommendations of the Department here.

Mr. CHANEY. At all events, we would be sure to secure uniformity in that way, in whatever result was reached.

Mr. FLEMING. There can not be any doubt but what it would reduce the number of accidents and prevent the loss of life, and no doubt prevent to a certain extent the waste in mining. I have a

memorandum here to refer to the great increase in accidents in the United States in the last few years, and the greater number of accidents and the greater loss of life, in this country, compared with the number of people working in mines as compared with other countries, where the governments have taken hold of this matter and have these scientific departments furnishing information to the operators.

Mr. HAMMOND. I understand you to say that you have a memorandum there?

Mr. FLEMING. I have a memorandum here, a pamphlet, which will explain that much better than I can, which came into my possession this morning, relating to coal-mine accidents and their causes and prevention. It seems to have been gotten up by the Geological Survey, by Clarence Hall and Mr. Snelling and Doctor Holmes.

Mr. HAMMOND. I would ask, if the governor has a memorandum showing the number of accidents here and the number of accidents elsewhere where there are scientific bureaus, that that be embodied in this report, so that the committee may have it.

Mr. FLEMING. Here it is. It is on page 6 of this bulletin. You will find at the top of that page a statement of the number of people killed in the mines of the United States per thousand. To show you how it is increasing, in 1895 it was 3, in 1900 it was 3.24, and five years afterwards, in 1906, it was 3.46. I have not anything since 1906.

In Belgium, where the Government has these scientific departments and furnishes the information required, to show how it has decreased there, from 1831 to 1840 it was 3.19 per thousand. In 1870 it was 2.60 per thousand. Their inspection and the work of the departments had decreased the number. In 1906 it was 1.02. Look at that decrease! This is on page 6. Now you can pass on from Belgium to other countries. In Prussia the number has decreased from 2.56 to 1.80. Now, can that decrease be because of anything but the regulation by these governments and the information they furnish, and can the number in the United States not be decreased in some way, and has not that number increased? I will show you what has been the increase in the United States. This is on page 8 of this pamphlet. From 1902 to 1906 the number of people killed was 3.39 per thousand. In France, practically during that time, it was 0.91. In Belgium it was 1 and in Great Britain it was 1.28. Those countries have these scientific departments. They have made these investigations which we are asking the Government of the United States to make with the hope that we can reduce now from 3.39 in 1906 to at least what it has been in those other countries. We certainly ought to have conditions here as they are in other countries, if we have the information. Why has it increased in the United States as these tables show? The answer to that shows the great necessity for this department. Why has it increased? Based on the thousand, the greater number of mines ought not to make an increase; but the mines are deeper where they are shaft mines, their haulage is farther, whether shaft or drift mines, and the territory worked out has increased so much, which brings us to the point which Mr. Wilson made about the generating of gas from the abandoned parts of the mines, and of course that is now one of the causes, that the mines are larger, partly worked out, still generating gas, and are more dusty than they used to be because

they cover more territory. One thing this scientific department might do that would tend above all other things to prevent accidents from dust would be to ascertain some way to dampen this dust, or prevent it from becoming dry by some other method than sprinkling, some atmospheric condition, some way of bringing the dampness into the mine through the ventilating current. As it is now, in the summer time there is not nearly so much likelihood of an explosion in a mine as in the winter. Why? Because the cold comes in and takes up the dampness in the mines and makes an explosion more likely. You hardly ever hear of an explosion in our mines in the summer time. It is nearly always in the winter that they occur.

Mr. CHANEY. I thought that might result from the fact that there is more coal mined out in the winter time.

Mr. FLEMING. No, sir; in most of our mines there is no difference. Where the mines are commercial mines there is no difference. They have their trade in the West and the East, putting the coal on the docks, and the little additional consumption to keep the people warm does not make any appreciable difference, in the larger mines. I think if you will look at the reports of the larger companies, at least, in most of the States you will find they are practically as busy one season as another.

Mr. CHANEY. We note quite a difference in coal mining out where I live; they mine more in winter.

Mr. FLEMING. That is chiefly for local consumption?

Mr. CHANEY. Yes; and then there is even more demand for it on the railroads, probably, especially in the winter and fall.

Mr. FLEMING. With us in the East there are local mines, and I suppose in Pennsylvania and other States; there is about half of our shipping to tide water and about half west. In the summer time the lake trade is good, putting it at the docks to go out next winter by rail, away out into the mountains. And east the same way. In the winter time when they can not ship coal by lake there is a greater demand for fuel coal, such as you speak of, but that just about makes up the difference, and our mines are just about as busy one part of the year as another. Now, if there could be something scientifically discovered that could be put into that atmosphere, into that air that is taken into the mines in the winter time, which would prevent the taking up of the dampness in the mine, you would do away with a great deal of danger from dust; and it does seem to me that something of that kind should be done. I am no chemist or part of a chemist, but it does seem to me that the talent of this country and the science that we have can discover, if their minds were put to it, with proper chemical tests and proper machinery, how many of these things that endanger the lives of miners and the property can be prevented. We can not do it. Have you gentlemen anything to inquire?

Mr. ENGLEBRIGHT. I think there is nothing further, Governor. I think you have covered the subject very thoroughly, showing the necessity of a bureau of this kind, and pointing out where certain lines of investigation can be taken up profitably.

Mr. FLEMING. I will say further, gentlemen, that if these explosions are going to continue we will have to go out of business. We can not stand it. Another such explosion as we had would kill us all. I heard the president of the company say that he could not stand another;

that he would not try to; that it would kill him. They are awful things. No one can understand it without seeing it, and those of us who have been through it just simply insist that something ought to be done; and certainly it is the province of the Government to do it, when you consider this great industry, second to none in the country, not only to conserve the coal and prevent its waste and the destruction of property, but above all to prevent the loss of life.

Mr. DOUGLAS. Mr. Chairman, I must say again that while this has been most interesting, and I have enjoyed the Governor's talk, I do not think we are in favor of a bureau of mines——

Mr. CHANEY. Will you allow me to make this suggestion?

Mr. DOUGLAS. Yes.

Mr. CHANEY. You and I are thoroughly convinced of the necessity of this bureau.

Mr. DOUGLAS. Yes.

Mr. CHANEY. But do you know of anybody else outside of this room who is?

Mr. DOUGLAS. The whole country.

Mr. CHANEY. I do not think so. I came up to the Capitol with a Senator the other morning, and he said: "I hope we will not have to establish any more bureaus. There is no use of it."

Mr. DOUGLAS. I think that is the general disposition.

Mr. CHANEY. There are some people who will require us to show the necessity for this, and you will find that there are a great many persons who belong to our end of the Capitol who will have to be convinced of the necessity for this, and you will find that it is very good stuff for our use, and I hope we will not fail to get out all the good reasons for it. The miners in my country have been quite in earnest about it for some time, as Mr. Wilson knows. He comes out in our country and tramps down the grass quite a good deal, and he knows about it.

At 12.45 o'clock p. m. the committee took a recess until 2 o'clock p. m.

COMMITTEE ON MINES AND MINING,
HOUSE OF REPRESENTATIVES,
Monday, March 9, 1908.

The subcommittee met, pursuant to the taking of recess, at 2 o'clock p. m.

**STATEMENT OF MR. J. H. WALKER, OF DANVILLE, ILL., STATE
PRESIDENT OF THE MINERS' ORGANIZATION OF ILLINOIS.**

Mr. WALKER. Mr. Chairman, there is not a great deal left to say after what was said this morning, and I might say that anything I have to present to this committee will not be from a theoretical point of view at all; anything I know about the subject I got as a practical miner.

Mr. ENGLEBRIGHT. That is what we want.

Mr. WALKER. I speak from my experience in the mines. For the last six years I have been acting as an official of the organization,

and while in that capacity I hear of some of the complaints that the other side have to make.

Of course the main point the miners are interested in is the saving of life and the making more healthful their occupation. The phase of it mentioned by Mr. White this morning has appealed to me a great many times, and I have mentioned it publicly, and that is the waste connected with it. I just want to mention this in passing. In the district I come from, particularly where I live, the Danville district, the town of Danville has been practically made by reason of the coal deposits there; there is not any coal left for a roof there; there is not any of the loss spoken of by men of one vein under the other—the loss that Mr. White spoke of this morning. But the mining out of that vein itself, the way they have to mine it in order to be able to meet industrial and commercial demands at the present time, compels them to work it in such a way that, without exaggeration, I know I am absolutely safe in saying that there is 40 per cent of that coal left in the ground, and it is left in such a shape that it will be almost impossible to ever get it again. I know that it will cost 1,000 per cent more money to get it up, if they ever attempt to get it out, than what it costs to take it out at this time, and the danger to life will be 1,000 per cent more in getting it out than it would be if they took the necessary steps to get it out at this time.

The CHAIRMAN. Could you not tell us how that happens to be left there? You understand that we are not all coal miners.

Mr. WALKER. They work it on the room and pillar system in order to get air in at all; they work two entries, one alongside of the other. The air goes in one and comes back out the other always, and you have to leave a pillar in between. In turning the rooms off they have to leave the pillars between each room, and the pillars they leave in are nearly always almost an equivalent to the amount of coal that is taken out, and there is not 5 per cent of those pillars that are taken out at all. When they strike a piece of roof that is exceptionally poor they leave that in there altogether. There are places where there are hundreds of acres that are not touched at all.

Mr. HALL. It is a question of leaving a sufficient support for the roof?

Mr. WALKER. No; bad roof. It would cost them so much in cleaning and putting in the necessary timber that they could not take it out and compete with operators who are mining coal in the more favorable natural conditions.

Mr. HALL. These pillars are left.

Mr. WALKER. These pillars are left, and in the course of time the roof comes in, the strata is all broken up, the water comes in, and it would be next to impossible to ever get it out. I have had some experience, actually worked in one place where they mined one vein under the other, with about 50 feet between the two, and it was only a 2½-foot working, coal and clay; they would not take out more than 2½ feet, and there were 50 feet of pretty good, solid strata between those two veins. But the natural settlement that occurred after that coal was broken up broke up the roof of the strata above the top vein they were working in when I worked there to that extent that they had to sink ten mines for one; it took ten mines, I expect more than that, sunk to be able to get out the amount of coal that one mine would have gotten out had they sunk it in the first place. Lots of it

was lost, so it was an absolute impossibility unless they worked it according to the plan Mr. Englebright suggested; that is, sink the shaft for that one particular place. There is this difference, Mr. Englebright, about mining out coal and getting gold in the gravel pit; as you mentioned this morning; you could not use one shaft and let it cave in again at all. If you let it cave in you would have to move out.

Mr. ENGLEBRIGHT. They always leave pillars around the shafts, you know.

Mr. WALKER. Yes; but that coal does not move; it would not cave back into the place where you had taken the other coal out at all. You would have to go on farther along in order to get the next. It would not fall back in at all, as gravel does.

From the point of view of an American citizen who wishes to conserve the fuel supply that we have, for the sake of the people who will be in this country, interested in this country, there is no question but that something ought to be done to utilize that fuel in such a way that people would be able to get the full benefit of it, and it can be done. The way things are now it would be an impossibility to do it. You can not enact legislation in a State and compel them to take out all that coal, because if you do you increase the cost of that coal to that extent that they would not be able to sell one pound of it on the market, for wherever that condition was not enforced in other States they would be able to ship in their coal and undersell them, and on that account it would be only through Federal legislation that it would be possible to make that effective.

Mr. HAMILTON. Just a word. Could we, by Federal legislation, compel the private ownership of coal mines to take out a load of coal if they did not want to?

Mr. WALKER. I will say I am not a lawyer, but I have read mining law very carefully, and I went through that law, a book about as thick as those three cases, the definitions and opinions of different judges, and I think it is so broad that if this Congress took the position that it was absolutely necessary and in the interest of the people of this country that that should be done, they would have that right.

Mr. HAMILTON. There is not any question but what it is to the interests of the people. It ought to be done if we can do it.

Mr. WALKER. I think you have that right under the law.

There is one proposition that is in actual operation now that we might cite as a reason why a bureau of mines might be beneficial in the way of saving life. We have in the State of Illinois a shot-firers law in operation. The miners have to pay the cost of those shot firers now. They have to deduct out of their already too small wages whatever it takes to pay the cost of these shot firers, but we find out since those shot firers were established there and started to work it has eliminated, it has been the means of saving at least 50 per cent of the lives that were lost from explosions of powder in those mines up to that time. There have been 50 per cent less lives lost in proportion to the men employed since the shot firers went in there than there were prior to that time. That only exists in Illinois, I believe. In the other States it is a question of what the miners and operators themselves have individually done.

Mr. ENGLEBRIGHT. Has not Pennsylvania a law something about shot firers?

Mr. WALKER. No; I do not think so. It leaves me strongly of the impression that if that accomplished that effect where there is less gas, and I think less danger of men being killed, there is less danger of handling powder than in almost any State in the Union; if that accomplished that effect there, it would be bound to have the same effect almost anywhere else in this country if it was put into operation. A Federal mining bureau would have taken up the question in a general way; their recommendations would have been made in a general way. I do not know whether you could pass a Federal law of that kind, but if they could have enacted the law and made it apply in the country everywhere there is no doubt but its effect would have been the means of having it established in almost every State in the Union, and it would have saved those lives—would save lives that are being lost every day because of the irregular and irresponsible system of handling just that one phase of the situation now. Since the shot firers went into effect in Illinois we have found that, speaking plainly, the powder question, where there is no gas, is the one question that, more than any other, is responsible for the accidents that occur there in Illinois. As you know, we have a contract over there to buy our powder from the operators. The majority of the operators, I believe, do not want to take any advantage in the way of introducing inferior powder at all; they know what it means; it means trouble in their mines as well as loss to the miners and loss in output to them whenever anything of that kind occurs. But with the operators doing the best they can and the miners doing the best they can, accidents will occur right along because of the present situation. You may get a shipment or a dozen shipments of powder and they are all uniform. If a man drills a hole and puts it in it will do all right. Then along comes another shipment, some brand, some grade, and all labeled the same, and everything, to all intents and purposes the same, and it will not have more than half or two-thirds of the strength that the other powder had; and you know the windy-shot proposition; it is not a question of putting too much powder in the hole.

Mr. WILSON. A windy shot and a blown-out shot are one and the same thing?

Mr. WALKER. Yes, sir; it is a hole where there is not enough powder in the hole to create a windy shot or a blown-out shot, where there is not enough powder in the hole to work the coal off that it is supposed to work off, and you can have a shot just as square and as nice as it is possible for a man to make a shot, and when you get a cartridge full of that powder that has not the strength that the powder you have been using had and you put it in there it does not matter how nice you want to make it at all it will blow out, and if the conditions are favorable it will make an explosion.

Mr. HALL. Do you know anything about the Masurite powder mentioned here this morning?

Mr. WALKER. Yes, sir. Speaking confidentially with men who are representatives of the powder companies in this country—I do not know that they would want to be quoted—they told me they did not care to get in bad with the company they were working for, but they just told me that it was unsatisfactory and there was not a powder up to this time that was absolutely safe; there was a degree more safety than there was in the black powder, but it was not absolutely

safe, and the danger in handling it itself as compared with the other powder was so much greater that it more than offset the possibility of saving lives through accidental explosion.

Mr. ENGLEBRIGHT. Do you use principally black powder; no dynamite?

Mr. WALKER. We use all black powder in Illinois. I never used any dynamite myself. I understand sometimes that men take dynamite, although it is against the law, and they are shown no mercy if they are found out. I should say it is not against the law, but it is a violation of our contract.

Mr. WILSON. Do you use dynamite in shooting rock?

Mr. WALKER. Oh, yes; in shooting rock.

Mr. WILSON. Another question in connection with the blown-out shots; you stated that the shots having the smaller charge were the ones that blew out. Is it not a fact that powder, like all other explosives, seeks the point of least resistance, and with the tamping in the hole behind the shot weaker than the hole itself, would not the result be, if there were not a sufficient amount of powder to do the entire work, that it expends itself in blowing out the tamping.

Mr. WALKER. There is no question about it; I assumed that these gentlemen understood that. The miners think they are entitled to this bureau in the face of what has been done for the public generally, and think they are entitled to it from another point of view. They buy this stuff; it takes a large per cent of their earnings to buy it, and if it is other than it is labeled, other than it is represented to be, there is just as much a fraud perpetrated upon them as there would be if you adulterated food stuffs which were labeled as pure. It affects them in that way. Whenever a keg of inferior powder is put in the man's hands, he has to pay the same price for it, and the chances are that through using it, not knowing what it would do, he will lose, in addition to what he lost paying for stuff that he did not get, an equivalent to a day or two days' work before that powder is used up. It is a big loss to the miner, and in the long run it works a loss to the operator, because he does not get as good results; it breaks the roof, rock comes down, and it is disastrous all around.

Mr. HAMILTON. What is the difficulty with this inferior powder, Mr. Walker? That is, you say it is not so strong, but is it mixed with something else?

Mr. WALKER. There are saltpeter powders and soda powders. But men who have had actual experience, both in using powder and making it, know that generally there is not so much difference in the ingredients in the powder. There is a difference: there is some sort of soda, and they know that if they use it altogether it means a saving of, say, 5 or 10 per cent in the cost of making the powder. But the pressure that is used, when it is in the doughy state, preparatory to putting into grains, cutting into grains, they say there is where the greatest difference occurs, and in the length of time that it is under that pressure. Powder companies, when they have orders for more powder than the factory has a capacity for, slight the powder in some way and send it out.

Mr. ENGLEBRIGHT. What would you consider a proper line of investigation for the Government to take on the powder question?

Mr. WALKER. I believe that if the Government, through analysis, were able to set down the ingredients and processes that each specific

brand of powder must go through, and have inspectors so that such shop and company would not know what day a keg of its powder was going to be taken up and tested, and if they were found wanting there would be a penalty applied for it—I believe that if that was done, it would eliminate practically all the danger that arises through that source, and I believe that is the only way it can be done.

Mr. ENGLEBRIGHT. Would not that properly come under the head of a State law, so far as any law, examination, and so forth, is concerned?

Mr. HALL. It would depend upon whether it was a State transaction or an interstate shipment.

Mr. WILSON. Would it not be possible to come under the Federal supervision for all material offered for interstate shipment?

Mr. HALL. Interstate shipment.

Mr. WALKER. I am satisfied that if the Federal Government took steps to provide for that portion of the powder that came within the meaning of the interstate-commerce act, that the States could hardly help taking the necessary steps to provide for the rest of it, that which was manufactured to use locally in each State. I know it would be the means of saving, I expect, 50 per cent of accidents that occur in Illinois now from those causes, and would be beneficial to the miner, of course, and to the operator. He would know, when he paid for his powder, just what it was, and if there were any blown-out shots, it would be a question of bad judgment. To-day in Illinois there are four or five companies, and when you get one keg of powder, after you use one and get the next keg, you are not sure, when you put it in the hole, what it is going to do. There is continual trouble, continual blown-out shots, and those are generally the causes of the accidents. I will state that there is not much gas, and on that account we have not the amount of explosions there are in the rest of the places; there is not that danger there, but even the way it is there are 50 per cent of accidents that occur there now from these causes that would not happen if there was such a regulation.

Mr. CALLBREATH. Does the strength of the coal to be blown out determine the amount of the powder?

Mr. WALKER. There is no doubt that the strength of coal would determine the amount of powder to be used in each hole, and after you have once determined that and have the standard by which to work in shooting that coal, then, although the coal remains stationary, if the powder changes in its power, it will have the same effect.

Mr. CALLBREATH. But the same class of powder that might be advisable to use in Illinois might be entirely too strong to use in Virginia.

Mr. WALKER. There is no question to a practical mining man about that. We know that soft clay will take one kind of powder and hard clay another. That is a matter that will be adjusted locally. Experience will settle that question, and it does settle it very shortly after a mine is in operation. After we get that settled, then if we had the powder question settled and knew just what it was, the danger of these explosions would be eliminated.

Mr. HALL. What you desire to do is to secure uniformity as to certain grades?

Mr. WALKER. Yes, sir; and we thought, too, that the oil question would come in the same sort of supervision. In the mines the smoke

and gas created by oil depend on the grade of oil that is used, and that is one of the things which makes it mighty unhealthful for the men working in the mines, namely, to have to swallow very much smoke from the oil. There is not anything that is harder to get out of your system. But we know that there are oils which give practically no smoke. They have a sort of a test over there, and the inspectors tell me that if there is a man living who can determine under that test whether a man is entitled to be fined or not, whether he is furnishing a grade which he should furnish, they would like to see him, because there is not one of them who can do anything with it at all. If we have that analyzed, it would be the means of making it a good deal more healthful for a miner, for after a man goes in a mile or a half a mile away from the direct supply of air, there is a great deal of gas, and gases of different kinds generated, and doing the best you can you can not get pure air into the mine. If there are five or six hundred men working in that mine with lamps on their heads burning inferior oil, by the time the air gets to the last man it would knock you down, it is horrible. These are some of the things that a bureau of this kind might have some effect in regulating.

Mr. HALL. Do you know, Mr. Walker, whether there have been any experiments to determine whether the oil of a high specific gravity as compared with that of a low specific gravity gave off more or less smoke and gas?

Mr. WALKER. They have a law to regulate the oil question in Illinois, now; it is a State question.

Mr. HALL. We have in our State, now; that is the reason I asked that question.

Mr. WALKER. I am not sufficiently acquainted with the different propositions in oil to be able to give you an intelligent answer to that question. But what we are contending with over there is that under that law they can not do anything.

Mr. HALL. We have a law in our State that prescribes the specific gravity of illuminating oils and excludes those which are too heavy because they give off too much gas.

Mr. WALKER. They are supposed to be excluded in Illinois the same way. The facts are that when it comes down to arresting some one for shipping inferior oil and giving in evidence in court to convict him, there is not any one in court to do it.

Mr. ENGLEBRIGHT. They do not use any candles? Out West we use nearly all candles.

Mr. WALKER. I have used some myself, and I believe they are a big improvement, so far as making the smoke is concerned, over the lamps.

Mr. ENGLEBRIGHT. But more expensive.

Mr. WALKER. You take the quartz mines; a man is right at his place all the time, nearly all the time, but in a coal mine you are going up and down everywhere all the time. In the first place, the current of air that has to be put through coal mines in order to make the air what it should be for the men at the face, has to be so strong; you know how it is with a strong current of air with a candle; it would burn the crown off your head before you were in there a half an hour or more, and you have to have lamps in a coal mine; candles would not be successful.

Mr. WILSON. What is your experience with the short tallow lamp?

Mr. WALKER. Oh, I just threw them away.

Mr. ENGLEBRIGHT. I think I mentioned this subject this morning, but I am not certain. On my recent visit to a coal mine, which I made out of curiosity, everything in the mine appeared black, every speck of light that hits the wall, or anything, is immediately dissolved. If you want to see anything, you have to hold your light where you want to see, and you see mighty poorly then. Of course, a great many accidents in mines are caused by caves, the caving in of the roof, and so on. Is not the fact of the poor light the cause of a good many caves happening, so that you do not anticipate them?

Mr. WALKER. Not with a practical coal miner. A practical miner or a man who is careless might, in isolated cases, have a tendency to slight something he should do, but the practical miner generally takes care to find out what is in his place.

Mr. WILSON. Is it not a fact that a practical coal miner depends upon the sound rather than the sight to determine whether a piece of roof or a piece of coal is unsound or unsafe?

Mr. WALKER. Always.

Mr. HALL. Would the use of electricity for lighting purposes be practical in mines?

Mr. WALKER. It would be practical where there was no danger of gas explosions, I believe. It would require a good deal of it, but I am satisfied that it could be used. I do not know whether it would be practical along the walls of mines or not, but where the roof is anyway good at all it could be used all right.

Mr. HALL. Would there be any particular danger, so far as gas is concerned, where the wires were properly insulated and incandescent lights were used?

Mr. WALKER. That is a question I would not be able to answer definitely.

Mr. HALL. You mean the gas proposition?

Mr. WALKER. There is just this danger, of a piece of flying coal cutting the insulation, creating a spark of fire, and causing trouble. Electric lights could be worked to success, I think, so far as the roadways are concerned. At the face it would be a handicap, where a man had to go up and down the place, from one place to another; he would be handicapped, and it would not work out successfully, I believe; but so far as the roadway is concerned it would simply be a question of putting enough of them in, and where there is no danger of explosions from gas it could be worked successfully.

Mr. WILSON. Is it not a fact that before the white heat of a filament in a bulb is extinguished it must come in contact with air? In other words, if you break a bulb the air must come in contact with that before the white heat is extinguished?

Mr. WALKER. I have been told that; I am not an expert.

Mr. WILSON. Assuming that to be the case, if a bulb was broken, as there would be danger of its being broken in a mine, while the current was on, would there not be danger of explosion?

Mr. WALKER. If there is any danger of explosion from fire damp, I do not believe the electric lights could be worked successfully. There is no question that there would be danger from the use of them, but where there is no danger from explosion from gas they could be used successfully.

Mr. WILSON. If there is no definite knowledge, would it not be a proper subject for a bureau to investigate?

Mr. WALKER. I expect it would. Of course the investigation of cases and the determination of just what their effect would be, singly and in combination, and the rise and fall of the barometer and the effect of mixtures of those gases, either singly or mixtures of them with the different kinds of coal dust at the different temperatures, would be matters of investigation, I think, in laboratories. But once those things could be determined, there is no question but what it would go a long way toward avoiding the explosions that we have. If you notice, you read the history of coal-mining industries, and you will see that every fall, as the cold weather comes in, every year almost, there have been numbers of explosions, so that the temperature of the air, the condition of the air itself, has something to do with the combustion or the possibility of creating an explosion. As Governor Flemming said this morning, it is possible that the coal dust in a mine he had reference to did not mix with water. There are some coal dusts that will mix with water. I have worked in some that mix with water, and the chances are that the difference in the quality of the coal dust would have some effect on its liability to explosions mixed with different gases.

Mr. ENGLEBRIGHT. I would like to ask you just one question right here. I do not want you to mention names, places, or anything else, but have you noticed any great difference in going to different mines, in some mines being kept clean and the dust kept in proper shape and others not?

Mr. WALKER. Yes; there is no question about that at all. The way our things are now it is largely a question of what the individual wants to do. There are some individuals who are operating coal mines who have that amount of humanity in them and regard for human life that of their own volition they will take every precaution to try to prevent accidents.

Mr. ENGLEBRIGHT. Right in that same line, of course, we have large mines, and we have small mines; we have mines operated by a few individuals, working just nip and tuck to make that mine pay. We have other mines where they are working to every advantage, every facility, and it is paying better. Would you notice any difference owing to such conditions?

Mr. WALKER. Well, my experience has been that a man who is making a good, big profit off his mines will take more precautions; at least, he will spend more money in providing precautions against accident than he would if he had a mine that was just on the surface and it was just nip and tuck whether he would go up or down.

Mr. WILSON. Would it not be, to a great extent, according to the nature or disposition of the man in charge?

Mr. WALKER. There is no question but what there are some men, but I think they are exceptions, Mr. Wilson. The ordinary man in a business of that kind is just about as I have stated. There are some men, I know one man, particularly, who is at the head of, I expect, one of the largest companies in our district. He will close the mine down rather than disregard the ordinary precautions—yes, and a little more than the ordinary precautions—in order to prevent accidents and loss of life, if that is what it means in order to run the

mine at an advantage to himself. They have closed down, they have put on more men than the law would compel them to, and taken more precautions. In some instances it is an exception. The ordinary individual in the coal-mining business, if he is making plenty of money, does not mind spending some of it in a precautionary way, but the same individual, if he is running on a very close margin, then he is not so particular and it takes a little more effort to get him to spend the money necessary to provide the proper safeguards.

There are matters that I am satisfied a bureau of this kind could regulate in a way that would be beneficial and save the loss of a good many lives and prevent a good many accidents. Take, for instance, one phase of it, the driving and trip riding. In the majority of mines there is no provision made for having everywhere room where a driver or trip rider could jump off in case of an accident. I expect that in more than 50 per cent of the mines there is not one place in 40 or 50 feet where, if something happened quick, he could step off to one side and let the trip go by, and in 95 per cent of the cases, all over the country, the driver rides the front end, or the trip rider rides the front end, and if you will notice in the statistics everywhere of accidents in coal mines, both deaths and accidents otherwise, you will find out that there is a large per cent of drivers injured because of that very fact. I do not believe that there is really any good reason why that driver should ride at the head of that trip. Where the company does not provide the safeguard, a place where they could step off in case of accidents of some kind, where they would be safe to let the trip go by, a Federal inquiry or a State inquiry into the matter might do some good. There is never any argument made on that proposition; they do not attempt to defend themselves, and in some cases there are laws providing, I think, for manholes being put every 20 or 30 feet, but there are lots of cases where these drivers run into one another. A trip may run away, a car will become uncoupled on the ride and another driver right behind it, and it will happen within that 20 feet, and he will go jammed into that. He either ought to be riding behind or there ought to be a place where he could get off where there is liability of an accident of that kind, and there are hundreds of them who get killed, get their legs and backs broken, just under those circumstances, where a reasonable precaution one way or the other, either compelling them to ride the back end or have a place where the man could get off, would prevent a great many of those accidents.

It is just the same in the case of falling rock. There are some objections to the proposition mentioned by Mr. Wilson about putting a cent levy on each ton of coal the same as an internal revenue, providing that it should go to the heirs of the man who gets killed, or himself if he gets injured. They say that if that is done they ought to be absolved from all responsibility. Here is just the situation: There is not any man, unless he wants to commit suicide, going to get himself hurt if he can avoid it at all, and I leave it to you, gentlemen, if a man wanted to commit suicide, he would not go down in a mine and pull a rock down on himself; he could find a more pleasant and effective way to do it than that. The way it is now, there is a sort of contributory negligence phase of the law which enters into all damage suits. It is the company's business in every case to prove

that it is contributory negligence, and it is the business of the man suing for damages to prove that it is the company's fault in not providing the proper safeguards; and there is not a practical mining man, if he will look his conscience squarely in the face and tell the truth about it, who will not acknowledge to you that it is not a question of enforcing the law to safeguard the lives and the limbs of the men who are working there, as much as it is a question of being safe from damage suits in most of them. It does not matter whether they have to provide some outside means of making themselves safe. They have regular bureaus established doing nothing else except proving that it was contributory negligence that was the cause of the different accidents that occurred.

The individual has not anything like the same defense at all. He is an individual alone, without knowledge of law, in almost every instance going up against a company that has societies—I guess you are all aware of them—indemnity associations all over this country, who have trained lawyers and trained men in the different industries, and particularly in the coal-mining industry. They know the questions to ask and the answers to get. It is not a question of the law, but it is a question of avoiding indemnity in an accident suit. Yet this proposition is just the same in a general way as all the matters in this connection, and I only mention it here. I am satisfied that if this bureau is established and they are given authority to investigate, and you provide them with the equipment and the funds necessary to make these researches, that it will, mean, before the end of five years, that there will be reasonable laws enacted in the different States, and that there will be some means whereby they will be enforced. The main point, though, I think, will be for this bureau; I think they will accomplish more than in any other operation, if they will provide some means, and have it enacted into law, of seeing that the different laws providing for the precautions being taken are enforced actively. There is a great majority of the operators themselves who do not want to avoid any of the responsibilities of that kind. There are a few isolated cases where they would not hesitate to evade responsibilities of that kind.

If you know anything about managing a coal mine, you know the mine manager who is able to put the finished product in the flat or the car at the cheapest possible figure is the man who gets the recommendation from the company and who stands the highest and rests the easiest with them. We know that in a great many cases where they have gotten instructions from the owner himself to comply with every law and provide precautions for saving life and limb the manager, in order to make himself a little better off and stand in with the company, will evade these laws, and the operator himself in ninety-nine cases out of a hundred does not go near the mine and does not know it himself. Of course there are some managers who get careless; they leave things to men under them to do and, like the operator, take it for granted that they are done. These people evade their responsibilities and their duty, and if they could provide some means of seeing that those laws are strictly enforced, they would, I think, accomplish more than they will in almost any other line of research or action that they will take up. In this country it is not like it is in the majority of countries, where this thing has been taken up by the mining bureaus. I do not know of a country where you could go in

and violate a mining law, and anybody know about it, where you would not have to pay a heavy fine. In this country, I venture to say, there is not a coal mine, hardly, that is run in strict compliance with the laws that are enacted in the different States. Some of the laws are impracticable, and some of them are, either through ignorance or otherwise, evaded, but there is hardly a mine that is run in strict compliance with the wording of the law.

I have heard operators admit that they were satisfied—and even in our State—that there was not a mine being run in the State in compliance with the law. It is evident to you, from what Mr. Fleming said to you this morning—he said they have chemists, they have laboratories, they have privately furnished means to try to find out where the danger is. Those operators every year say just about the same, and there you are, and there is not one of you, I suppose, who is not willing and wants the worst way to do something that may eliminate the danger of these accidents, both in explosions, loss of life and limb, and all that. But unless we have some provision made to carry on investigations by men who have every facility to do the work, it is going to be impossible to get the laws framed just right and know how to go about it to enforce them, and I think there are laws in the different States to-day that are impracticable laws. Men know what is wrong and they are trying to provide something that will eliminate the danger, and they are doing the best they can in order to do it. You know how it is when there is an explosion and men lose their lives. Everybody gets interested, intensely interested; they want to do something, and without thorough knowledge of the subject they do the best they can, and they pass laws that either do not accomplish what they are trying to, or are impracticable; but the thing has gotten to the place now, however, where, I think, there is no good reason why poor laws should be made in the United States on these questions. I do not think there is any good reason that can be assigned why there should not be good laws which would eliminate almost 99 per cent of the deaths and accidents that occur in our mines in this country.

Mr. CHANEY. If they would be eliminated to that extent, it would pay to work it out.

Mr. ENGLEBRIGHT. If you can get it 50 per cent you would do a great deal.

Mr. WALKER. If you get it 50 per cent, it would be just about as easy to get it another 50 per cent.

Mr. WHITE. Have you thought about what can be done to provide a higher order of intelligence and information on the part of the miners themselves? In other words, the most intelligent miner has no greater safety for his life than the most careless and the most ignorant one.

Mr. WALKER. I expected to mention that matter, and I want to have you believe, if you can, that I am not biased in the matter at all. All men, almost, look alike to me. I have just about as much respect for an honest man coming from one country as for a man who has been born and raised in another country, and if he goes into a mine I think his life should be safeguarded just as much as the life of any other man. There is no question but what men are taken into the mines, however, and are put in charge of places, in dangerous mines, where there is danger of explosion, who never saw a mine

before in their lives, and do not know anything about the danger they are working in at all. The practical coal miner gets careless at times; there is no question about that; but it is generally where he gets careless where the thing is practically safe. Where he gets nipped at times is where something almost extraordinary happens, because everything is looking safe and he has been working along without paying particular attention to himself. The majority of these accidents which occur from the ignorance of the men actually do occur as a result of the action of the men who are brought in there who are not practical coal miners at all. We have been trying, in Illinois, to get a qualification act established. The operators themselves, in joint conference with us, after going over it carefully, agreed with us that they would raise no opposition to it.

Mr. WILSON. Is it not a fact that the ignorance of one man in a coal mine endangers the lives of all the others that are working in the mine?

Mr. WALKER. Where there is danger of explosion.

Mr. WILSON. From gas or from blown-out shots.

Mr. WALKER. Yes; where there is an explosion from a blown-out shot it is an explosion just the same, and where he is working on an entry, if you go past that entry you generally go past there with a running jump, because he may have put a shot there and it is likely to hit you going past his entry. That thing has occurred sometimes. But the real danger that we have—we have no danger from explosion—is that there are mines where there is great danger of dust or coal-gas explosion. There ought to be, and there must be if you are going to make them safe at all, some examination that the man should pass before he goes down there, and after you have made him pass an examination that shows him to be a practical miner who understands his business, then there must be some safeguards provided that would prevent him, even if he wanted to, from endangering the rest of the men in the mine. After you have done that, then you would have to provide some other matters to see that the fellow who has these matters in charge is compelled to do his work besides. In our mines, and in the ones in which there is no danger of explosions that would mean the blowing up of all the men, the conditions are such that a man going down into that mine should be able to pass an examination showing, when he is in charge, when he is at work at that mine, that he is qualified.

I can cite you an instance; I have seen a good many of them. In this particular instance the mine boss is dead and the man is dead, and I can repeat it without hurting anybody at all. I was taking up the collection for the widow in No. 3 mine, Kelly's, at one time, and in going through that mine I came to a place where there was what we call a greenhorn, Lithuanian, who was working. He could not speak English, and had just come to this country. There was a bad roof over him, but he could not tell a bad roof from a good roof, and he got almost under the face, and I stopped, started back, and hollered to that man to come out of there. He did not come out, and I took a jump in and brought him out. I went and got the men in the next place to him and explained what the danger was and had them go and see the place, and I told them to compel them to prop that place. Then I went out and met the mine manager, and I told him that if he allowed that man to work in there it was only a matter of

time before he would be killed, and if he did it now, when he knew the facts, it would be nothing more or less than murder. That mine manager told me he needed men and he could not afford to discharge any man who was willing to work there. "For the love of heaven," I said, "send some one in there who will take care of it." He said I was not getting paid anything for acting as mine manager, and I agreed with him. He said he had a certificate and he was qualified to run that business himself. But the next morning at 10 o'clock that man got killed in that place, and I happened to be on the mining committee, and I helped to bring him out. When I got to the door the mine manager was there. I did not need to say anything. The big tears were rolling down his cheeks. He said, "Walker, I hope you won't say anything to anybody about this thing." There was a fairly conscientious man acting as mine manager, who put that man in there and thought he would be able to take care of himself with the assistance he could get. That man had a family of seven children and his wife, and you can just understand what that meant. That is only one of hundreds of cases of that description that occur all over this country, and there is no question but that there should be some means provided for seeing that a man is qualified before he goes down into one of those mines.

Mr. CHANEY. Your point is that when this proposed Bureau is established some means can be contrived by which all these questions can be considered?

Mr. WALKER. Yes; I believe that if this Bureau is established and that is made their specific business, namely, to look after the mining industry, that it may have the proper equipment and competent men who will look into all these mining questions.

Mr. CHANEY. In a case like that you cite, I am inclined to think it is purely a question of the exercise of a little common sense.

Mr. WALKER. No; had that man been compelled to undergo a simple examination in the common things of mining, had he only been compelled to demonstrate that he knew when a rock was bad over his head, or when it was good, he would not have got down into the mine at all; he did not know a thing about it. In general cases, where there is no danger of explosions, a general qualification could be applied, but where there is danger of an explosion, either dust or gas, from blown-out shots, there should be proper laws made to apply to those particular mines, and in that way I believe you would eliminate the danger.

Mr. CHANEY. The competent mine manager would have saved that.

Mr. WALKER. He was considered to be about one of the most competent there was in that State.

Mr. ENGLEBRIGHT. But he was careless. Is it not a fact that every man who has anything to do with a mine, from the general manager down to the humblest car boy, is in a position of trust in a mine of that kind?

Mr. WALKER. He is, but there is also another feature that enters into it, Mr. Chairman. Take my own field as an illustration. I can speak with authority on the question. There was a man who held the position of mine examiner, and that is really one of the most important positions there is in a mine if a man is conscientious and carries out his duties in that sort of a way. The mine examiner, if

he marked the places and reported them as dangerous and in need of attending to, and stopped the places that should have been stopped, he would be compelled to leave, and it was simply a question put up to him in this way, "It will be easier for you, a good deal, to make out your report with everything as all right. You will draw your salary just the same." They would not state it to him in that language, but it would mean that. "You go ahead and do your work. It would cost us too much to do that work, and we are not going to do it." I expect you could find it all over the country just that way. Mining superintendents would be given instructions to carry into effect the law, provided that everything was done that could be done, giving them to understand that if it was carried into effect they would be discharged.

Mr. WILSON. The mine examiner in Illinois is the same as what is known as the fire boss in Pennsylvania and some other States?

Mr. WALKER. Yes.

Mr. HALL. Is he a public officer, or an employee of the company?

Mr. WALKER. An employee of the company, although the company is compelled to appoint him under the law.

Mr. HALL. But the company has his selection and the right of discharge?

Mr. WALKER. It has.

Mr. HALL. What do you think about making that a public office, where the company would not have the right of selection and discharge?

Mr. WALKER. If you have as much trouble as we would have, you might make it over here in Congress.

Mr. HUFF. Did it ever occur to you that the operator requests that officer to see to it that the mine is conducted for the safety of the miners and for the protection of life and to the best interests of the mine worker and owner?

Mr. WALKER. If I was operating a mine and I had one of those men hired to me, I would expect him to do that.

Mr. HUFF. Is not that what he is employed for? It would be a grave suggestion for you to make to this committee that the man would be discharged because he tells the operator the true condition of his mine. You must not make that statement unless you absolutely know it. I desire to say to you and to the committee that I am a mine operator, and I am more than surprised to hear you say that any mine operator, who has intelligence and is a man who has the welfare of his fellow-man at heart, will discharge a man because he tells him of the situation, and that he employs him to misrepresent the condition of the mine. That is going too far.

Mr. WILSON. Might I ask Mr. Huff a question?

Mr. HUFF. Yes.

Mr. WILSON. Are you in a position to say that all operators take the position that you now state?

Mr. HUFF. I am in a position to say that an operator must not without a trial be charged as a criminal, because that is what he would be purely and simply. I am not defending all operators; I am only saying that it should not be stated in a general way that a man will be discharged if he tells the true condition as he finds it, if that condition is not pleasing to the operator.

Mr. WILSON. If I understand Mr. Walker's position, he is stating now the incidents that came under his own personal knowledge.

Mr. HUFF. Mr. Walker has intimated there is not an honest operator in his State; or rather that all their mines are managed in this careless way, and that no man dare report conditions unfavorable to the owner.

Mr. WALKER. Oh, no; I did not say that exactly.

Mr. HUFF. You said in so many words, there was not a mine conducted in your State according to the law. It is a broad statement to say operators and mine examiners are all lawbreakers. I do not defend any mine operator; I only state it is too broad a charge to make. I hope the gentlemen of the subcommittee and all the gentlemen in the room will pardon me for having said one word. I did not come here to utter a syllable, and I hope the stenographer will not report me as saying anything, because I am here to learn, but I do not like to hear all operators and mine examiners classed as criminals.

Mr. WALKER. Mr. Huff, I expect that if you will ask the chairman of the operators association in Illinois about that matter he will tell you as frankly as I have made the statement here.

Mr. HUFF. I think you should carefully investigate, and if the situation is as you state it should be speedily corrected.

Mr. WILSON. I understand that the chairman of the operators' association of the State of Illinois will be here on Thursday for the purpose of appearing before this committee, and I suggest that Mr. Walker's remarks on that particular phase of the Illinois law be read and his opinion asked.

Mr. HUFF. That is better.

Mr. WILSON. The position, as I understand it, taken by Mr. Walker is that through lack of the necessary information in the formation of the laws, the mining laws of the State of Illinois, they have been made in such an impracticable manner that it becomes practically impossible to comply with them, and that because of that impracticability on the part of the laws of the State of Illinois, framed as a result of a lack of information as to what they should be, the operators and miners combined, of the State of Illinois, can not comply with it and do not comply with it.

Mr. CHANEY. Yes; but I understand that Mr. Walker does not say that they purposely violate the law.

Mr. WALKER. I think, if my full statement is read, you will see that it is because of the impractical laws that are there this condition arises, and that was one of the reasons I said that a bureau of this kind, given the necessary equipment and the funds and the time to make this their business and to enable them to frame proper laws, would be a great help.

Mr. ENGLEBRIGHT. What I understand Mr. Huff to be finding fault with is that there are certain fire bosses who are supposed to report everything, and you claim that they do not do it, by the order of their superiors. That is the statement that I understood Mr. Huff to take exception to.

Mr. HUFF. I do not feel that he should charge them with conniving for the sake of a few dollars to kill somebody, or hundreds of people, if you please. That is neither fair to the fire bosses, the mine

inspector, or the operators; but if the laws are lax, Mr. Walker, let us try to remedy them and not to make charges against anybody. I think our Pennsylvania laws do protect the operatives as nearly as possible, and I hope we are obeying them. Something may be learned to further safeguard life and to conserve the coal, as somebody, Governor Fleming and Mr. White, spoke this morning. We are all anxious to do this, also to avoid accidents, that the hazards of mining may be minimized, and thus the miners' occupation will be uplifted and benefited. I have too much respect for the coal miner, the coal boss, and the coal operator to believe that they would band together to destroy or take unnecessary risks for the sake of a few dollars.

Mr. WALKER. You will notice that my remarks on this subject came right down to where I was attempting to make the point that if this bureau was established I believe they would be able to find some means of having the laws enforced, and I went on to cite some of the things that I know of now, where even an enforcing of present laws would be a benefit. I went on to cite some laws that are now recognized as impracticable by both sides, that they could not live up to in a practical way at all and operate the mines with profit, because of the different accidents that had occurred; that men actually wanted to do something to eliminate them, and they did not have the necessary information to make the laws in such a way that they were practical and would eliminate the evil.

Mr. HALL. You did not intend to give the impression that it was a general practice among operators of mines to suppress information where it would be obvious that they had done so merely for the purpose of saving expense, although it would endanger human life?

Mr. WALKER. No. To begin with, I think I made this statement, that a majority of operators wanted to live up to the law, and they wanted voluntarily, of their own accord, to see that every safeguard was provided that the law required; that some of them went farther as individuals; that there were some of them who would not scruple to evade the law to their own profit, and that there were some managers in order to make things better for themselves with the people they work for, although the operator himself wanted to see that everything was done that ought to be done, would evade responsibility, and that a bureau of this kind would take the whole thing in charge and make a thorough investigation and require what the laws should be, and that I was satisfied that a bureau of this kind would find some means of seeing that these laws were enforced. The particular case that I was mentioning when Mr. Huff arose reminds me that I know one man, a superintendent, who failed to discharge his duties, at the suggestion of the operator.

Mr. HUFF. In that case the superintendent should have been dismissed or disciplined.

Mr. WALKER. You would have a job punishing them.

Mr. HALL. I take it that the distinction which Mr. Huff draws is this: That all mine operators should not be classified as suppressing these matters because some of them do.

Mr. WALKER. I am satisfied to agree with Mr. Huff on that proposition, but what I am trying to get at is this: That I do not believe there is a mining man on earth who has had practical experience but what knows that a great many of the accidents are directly attributable to their negligence or carelessness or evasion of existing law, and

if a bureau of this kind was established, when they found out what the facts were, if there was any possibility, and I am satisfied that there would be, they would provide some means of seeing that those laws were enforced, because there are some men who will take advantage, no matter what the cost is, and that is one of the things in the mining industry we have to contend with. Generally when things happen to that description they can not locate the real reason.

Mr. CHANEY. Of course you realize that however well prepared and however practicable laws may be, unless there is an earnest and honest administration of them, you could never correct these troubles and save these lives and avoid these accidents.

Mr. WALKER. That is true.

Mr. CHANEY. It would be those things that we are not well enough acquainted with yet, as to how to get at the difficulties, that this bureau would be able to reach. Things that we are well enough acquainted with now would not be considered very much by the proposed bureau; it would be those things that are not now thoroughly understood, and it would be their duty to try to find out the best and most practical way of discovering and avoiding these dangers and difficulties in the future.

Mr. WALKER. I think they would find out one of the things that would accomplish as much or more good than anything else would be to find some means of having whatever legislation was enacted enforced.

STATEMENT OF MR. W. D. VAN HORN, PRESIDENT OF THE INDIANA MINERS' ASSOCIATION.

Mr. VAN HORN. Mr. Chairman, it appears to me that the ground has been pretty well covered, and I will take up very little time. However, there are a few points that I want to bring out, if possible, to show why such a law should be enacted. As I understand it, this committee now rather desires points that can be used in argument in favor of enacting this law, as we have been given to understand that the committee is a unit, as far as they are concerned, in asking for this law. This is what we did not know, and to a very great extent this relieves us of a good deal that we thought would be expected of us in this matter.

I want to speak from the standpoint of a practical miner rather than from a scientific standpoint. I have had thirty-two years' experience in the mines in Indiana and about four years of the time as mine manager, and have tried to be a close observer of all these questions we have been discussing here, and the strongest point why we should have this law, it seems to me, is because of the division or the difference of opinion between the practical man and the scientific man. It is a hard matter in a great many circumstances to convince the practical miner that many of the theories of the scientific men are correct; in fact, it is an impossibility to convince us in many respects. We want to point to this fact to show that it is necessary for Congress to take this matter up and straighten it out, bring us together as practical men and as men with scientific knowledge. We do not believe it can be settled by States, because we see that in one State possibly the practical men will have the advantage in legislation and in others the scientific men, and we can not agree; so it will

be necessary, as a Congressman here suggested this morning, to bring the matter to a focus; in other words, bring these ideas together.

I might, just for illustration, as I do not want to take up much of your time, say that here is a scientific report of some explosion somewhere, and the cause of that explosion was black damp. You could not convince a practical miner in one hundred years that black damp would explode. In fact, when you break into old works you find black damp; you find it as a stone wall against the good air, just straight up and down. Six inches is good air, air passing along beating against that damp just like a wall. You pass your light from 6 inches here over, and the minute it strikes the black damp it will go out just as quick as the minute you put it in a bucket of water. It could not go out any quicker. You take it away a dozen times and light it and put it back and it will go out. You could not convince the miner that that would explode. Not only that, but in all the other things, dust explosion, and so forth. Will dust explode? How much gas does it take in addition to the dust to cause an explosion? You have read and heard all the theories and studied them, and they must be brought together by a powerful measure in some way that will bring it up to where they will understand it. There is not any question about the scientific man being wrong in many cases, and in many cases possibly the man who has the real practical knowledge does not understand it as he should—the gases and the formation of gases, and so forth. It is not necessary to discuss that.

I wanted to point this out for the reason that I wanted to impress upon this committee that it makes it more and more of a necessity that this should be done by Congress. The States can not do it; we are divided everywhere. We are divided in regard to a method of enforcing law. Many people believe, as Mr. Walker gave you a very broad illustration, that laws will not be enforced because officials are surrounded by certain conditions and by certain parties, or something that is tied to them, or a man is employed by a company. We have all these things to overcome. A man is employed by a company that might not want to go to an extra expense. As a practical man I have ideas; I have ideas as to explosions. We have gas in nearly all the mines in Indiana to a certain extent. You could not make me believe that the setting off of 8 or 10 or 15 kegs of powder would cause an explosion. I have worked in the mines when 600 men fired shots within five minutes, and never heard tell of an explosion in Indiana. For years and years—in fact, for the first fifteen years of my life—I never heard tell of a windy shot. That is what makes it necessary for Congress to handle this matter and bring this knowledge up together. With both the practical and the scientific knowledge it will have to be done in our State to give satisfaction, it can not be done in any other way; and I would not want to attempt to say just what ought to be done, but if we get the law I am satisfied that it will be worked out properly. For instance, we have a law that says an air shaft shall be sunk so many hundred feet away from the hoisting shaft for safety; that so much air shall pass around, so many hundred feet for a man and so much for a mule. We have those laws. Of course, as Mr. Walker says, in many respects the law is violated by the men and the company; both by the men and the company.

It seems to me it is almost impossible to live up to the law, both on the part of the miners and on the part of the operators. For instance, with such measures in force we could have two air shafts, one on each side, and the fan should throw the air down through a double air way, sending it up this way and pulling it out of the air shaft at shooting times. This fan would be reversible, so that if an explosion occurred it would be pulled away, the force of it would be pulled away from the men coming out of the hoisting shaft and give a great deal more air and better air. Nobody could fire a shot until the fans were reversed. Another method would be—of course it would cost—another fan shaft to be sunk, which would entail some expense, it is true. We can not correct this thing without expense; it can not be corrected by anybody without expense. The close competition that the operators have makes it necessary to give them due credit; it makes it necessary to cut the expenses in many cases. In some cases they are not justified in that, yet it is perfectly natural for everybody to make money if he can, perfectly natural, and he will do his best to make money. I do not want to incriminate anybody, but I am perfectly willing to say that both operators and miners violate the law in Indiana, and it would be right close to impossible for either of them to live up to the law strictly and absolutely.

I want to touch just one little point on dust. It is not my experience that any dust—coal dust—will not mix with water. It will stand quite a little while if a roadway is sprinkled, some particular coals, and the dust will float on top of the water. But if it is left there a short time, it will mix, it will soak through and get wet; that is my experience in the mines and I have had quite a good deal of experience. We find the method in England, one particular method that I remember, a case cited now in that respect where out under the ocean where they are mining coal for several miles, they pipe their entries, and those pipes have the very finest holes in them; they are filled with water, and it is just like a very fine spray all the time the mine is running, to keep down the dust. It is piped all over each entry, where this dust is. We have a good deal in Indiana to contend with, and sometimes it gives us some trouble; sometimes the miners refuse to work until the roads are sprinkled for fear of an accident.

Mr. WILSON. Has it been your experience that the introduction of a chain machine in the undercut of the coal creates a greater amount of dust than in the old method of pick mining?

Mr. VAN HORN. Yes; there is more dust.

Mr. CHANEY. I suppose one might say there is more picked up by a machine than there was before?

Mr. VAN HORN. It is the power, the mining by power.

Mr. ENGLEBRIGHT. What about these other machines, the punch machines?

Mr. VAN HORN. They do not raise as much dust as the chain machine. I think we have every kind of a machine in Indiana. Of course, as I have been handling their questions as president for five years past, I have had to deal with all of these questions; I have had to deal with every question of that kind.

Mr. BARTLETT. If you have reached the end of your train of thought on those matters, I would like to ask you a question that is a trifle foreign to it and I would like to have you gentlemen, who appear to

be representing various mine workers' associations and who from your years of experience seem to appreciate the necessity of having practical experience join hands with science, tell me from your consideration of this whole matter, have you considered the wisdom of putting this bureau into any particular department, and what are your reasons for it? In other words, do you believe it should be a part of the Department of Commerce and Labor or go into the Department of the Interior and become an adjunct of the Geological Survey? That is a matter I would like to have some light on. We are a unit as to the necessity of this bureau, but where we are going to place it is a question, not only with this committee, but it will be on the floor of the House. What is your opinion about that?

Mr. VAN HORN. Mr. Chairman, I only hope that the committee will be able to agree on that matter. I do not consider myself a competent judge in that respect.

Mr. BARTLETT. What is your idea about it?

Mr. CHANEY. Is it your idea, Mr. Van Horn, that the practical knowledge which you mention as being important should be founded and joined with the scientific and theoretical knowledge like that which is conducted at the Geological Survey of the Government?

Mr. VAN HORN. Yes, sir; I think that there is not a very good chance of getting results from a law of this kind without joining the two forces; that is my idea.

Mr. CHANEY. The question as to whether the practical carrying out of the law would be better in the Department of Commerce and Labor than in the Interior Department would depend upon whether it could be handled in one Department better than in the other?

Mr. VAN HORN. Mr. Chairman, I do not want to answer that question; I do not consider myself a competent judge. I would readily give you my idea if I felt that I was competent, but I do not feel that I am competent; I have not made that a study at all, not a bit. I possibly could have been prepared if I had known it was coming up.

Mr. BARTLETT. It was merely to get suggestions, if you had any. Mr. Walker, have you any ideas about that matter which you care to suggest to the committee?

Mr. WALKER. These are my views on the question: Every locality, almost every different section, has a difference in the strata. The work of the Geological Survey, as I understand it, is to be able to give a complete description of the different stratas that are met in the different localities, and so far as the work of maintaining a roof is concerned, particularly the roof, the knowledge that they get through their investigations of that strata would be of invaluable aid to the department of mining in providing for the best means of taking care of that roof. It would mean the saving of property for the company, the saving of expense, and the saving of life for the men.

Mr. WILSON. Do you believe, then, that no matter which Department a bureau of mining may be established in, that the Geological Survey, even though it might be separate and apart from the bureau of mining, should be in the same Department with the same head?

Mr. WALKER. I can not tell you anything about the relations which the Departments would have with each other, but I believe that the relations of these two departments ought to be so close that they can work in cooperation with each other.

Mr. HALL. Just one question. Which do you think the mining industry and the miners would be most benefited by, experiments and

investigations of a scientific nature by experts making tests concerning the explosive properties of dust, gas, and so forth, or by taking the statements of practical miners in the various mines as to what their theories are concerning the causes of these explosions? In other words, do you think that the miners need assistance most of a scientific nature or of an industrial nature to be of benefit?

Mr. WALKER. Well, they have the practical knowledge, so far as they can get it by their everyday work, and the other knowledge must come from the scientific end of the department. They have all the practical knowledge they can get by their actual everyday experience in the mines. The analysis of the different propositions they have to go up against, giving them their right names and what the effects will be, coming from the Geological Survey or from any commission that would be able to speak authoritatively on these questions, would be of benefit to them. They will have to get it from them; they can not get any more knowledge in a practical way than what they have. They have to get it from the man who is able to take it into the laboratory and dissect the whole proposition and give it to them in detail.

Mr. WHITE. May I have a word on that same subject and explain what I said this morning?

Mr. ENGLEBRIGHT. Certainly.

Mr. WHITE. I was asked this same question by the gentleman from Ohio, and my answer may have been misunderstood, as to whether these departments should be separate or not. I mean that they should not be put under different Cabinet officers. While the work of the new bureau of mines to be established, which we hope will be established, should be entirely separate as an organization from the Geological Survey, I think it would be a fatal mistake to put them under different Cabinet officers, and I think they should be under the same, because their work will necessarily overlap. For instance, this matter of the study of the strata, which is purely the study of the geologist.

Mr. CHANEY. That is an excellent suggestion of Mr. Walker, showing how closely the relations should be.

Mr. WHITE. Why duplicate and create additional expense when you have a trained scientific staff to do that same kind of work? If they are under the same Cabinet officer, he will so divide it, will have the power to do so, that there will be no duplication of work with that added expense, and all the additional knowledge that is rendered accessible by the work of the Geological Survey can be made available without any extra expense to this new bureau. It should be entirely separate in this new organization and have a head to it like the Director of the Survey, working under the same Cabinet officer, so that they can combine the work in this new department of the scientific workers and the practical workers and get the benefit of both. I think the Geological Survey is already in the Interior Department and has been so successful that it should be continued there; and if it is not, the Survey should be moved wherever you put this.

Mr. CHANEY. I want to say to you that Mr. Van Horn is known to us all out in Indiana to be a very practical man. I would like to have him state to this committee what advantage he thinks this scientific investigation and the propositions which could be embraced in a bureau of mines and mining would be to him.

Mr. VAN HORN. To the miners?

Mr. CHANEY. To you in your work.

Mr. VAN HORN. Oh, yes; I think it would be a very great advantage to everybody.

Mr. CHANEY. In what respect do you think it would be an advantage?

Mr. VAN HORN. First, of course, the saving of life; that is the first, of course; that is the greatest, and also the saving of property. I mean by that they would not have the property destroyed by explosions as we have them now in Indiana, once in a while, but we are having them protected as well as we can by having the shot firers.

Mr. CHANEY. How would a scientific study of the thing help you in those respects?

Mr. VAN HORN. In that respect we would be able to solve many questions. Our people believe a lot of things. For instance, you heard Mr. Walker's argument on the powder question; we have the same thing to contend with. We believe that the argument that the same ingredients are now in a keg of powder as were in it twenty years ago could not be correct, for 15 kegs of powder exploding in the same territory now cause an explosion when 50 kegs of powder did not cause an explosion fifty years ago. It would help us to discover whether it is in the powder or in the gas, the coal dust, or whatever it is. We know it is not in the black damp. These matters can be adjusted so it will help us to find out what it is, and we can better protect ourselves if laws will be passed; it will help us to get a good grade of powder and a good grade of oil, and then help us on the distinct proposition of what should be done by the operators. Of course it would be a very great help, just what the miners want, and I believe what the operator wants.

I believe it is what the operator wants because a law covering the whole field will not change the competitive basis, treating all alike; but if in one State you legislate, take 1 cent in this State and none in the other, it disturbs the competitive relations. I believe our operators will favor this. You see, they have gone with us a long way in this matter. We would like to go further in some respects, but we believe the matter will be solved if this can be put through. We believe it will be solved to the satisfaction of the people, or, at least put us in the position where we can hereafter find out the defects and make corrections, but the way we are divided into States and differences of opinion prevents us, through the different legislatures, from getting these laws. We can not get them. We have just the same thing in Indiana as Mr. Walker said he had in his State, Illinois; we find that the laws are foolish in many respects. In some respects we might say they are foolish in not being severe enough on the operator; in other respects we might say they are foolish in not being severe enough on the miner. The legislatures, in their desire, right after an explosion, to pass laws to protect lives and limbs of and property of the citizens, have passed laws which did not fit the cases at all. I could name you some of them and could show you why, but I do not think it is necessary.

Mr. HALL. Generally, I presume, because they are laboring under some erroneous impression as to the cause of the explosion?

Mr. VAN HORN. Just so.

Mr. HAMILTON. And impressed at the time with the great desire to do something, and did not know what to do?

Mr. VAN HORN. Yes; they wanted to do something to relieve the situation.

Mr. CHANEY. You will understand, Mr. Van Horn, that Congress could go no further than to undertake the necessary development of scientific knowledge on this question, and that the States would, after all, have to supplement what might be done here in the police regulation of the mines and the work that would govern the operator and the miner. It would, after all, have to come from the State. We could not make a general law here that would apply to Indiana in the operation of the mines there, or any other State. The most we can do here is to endeavor to find out the causes of all these things by a scientific study and investigation of the underlying principles involved.

Mr. VAN HORN. Yes, I will admit that, but we believe that that will give us a chance to act as a unit in the different States.

Mr. BARTLETT. It would bring about a uniformity of action?

Mr. VAN HORN. We believe we could solve the problem, or you could solve the problem for us, and we could adopt it.

STATEMENT OF MR. J. M. CRAIGO, OF WEST VIRGINIA.

Mr. CRAIGO. Mr. Chairman, I do not see much that is left for me to say. Almost everything that I can think of why this bill should pass has been said, and there have been several things brought out that I never thought of before. One thing, especially, Mr. White brought out, about the waste, and he mentioned about commencing at the bottom of a hill and taking out big seams of coal first. Naturally, I then got to thinking that if you take out a large seam of coal down at the bottom, work it out, and the mine would be abandoned, if it generated gas, and when you went to working out one above that, that old mine would be full of gas and the rocks between the two seams be cracked, fissures running through it, and there would be no place for that gas to go except up into the other seam that would be working. That is one danger that I had not thought of that was brought out by Mr. White.

I know that the miners in West Virginia are a unit, and I suppose, perhaps, for all I know, in other places, in wanting this bill passed, first, for the saving of life. There is not a State in the Union that has had as many explosions recently as West Virginia has had. I think we have had five in the last year, and in one, as Mr. Flemming said this morning, 350 people were killed. Almost a year ago there was a commission appointed by the legislature to make investigations and recommend some bill to the legislature that would prevent that, but as yet it has never been found out definitely, that is, satisfactorily, what caused the explosions. That alone, that terrible loss of life just in that one State, surely would get us in that State terribly in earnest, when we would want the National Government to make this bureau to find out some means to prevent these explosions.

I do not know of any theory that I could advance, but I think that I could just make it short, reiterate or emphasize practically everything that has been said here from our side—that is, I mean from the

practical miners' side. I do not know anything about the scientific side of it; I never studied that any. Since I was 12 years old I have been making a study of the practical side of it. When we can not find out the cause of the explosions, then I think there should be a joining together of the practical and the scientific forces to find out some means to prevent these explosions. As I told you, I do not deem it necessary for me to take up any time when practically everything that I would have to say would be in fact repeating what some one else had said, because everything I could think of, every reason why this should be passed, has been said. I think that the operators and the miners of our State are united in asking that this department be made at this term of Congress. I think it is the most important thing there is claiming the attention of this session of Congress.

Mr. Chairman, I do not think of anything else now that I wish to say, as I do not want to take up your time repeating.

Mr. HALL. Evidently one of the principal questions that this committee will have to determine is whether this bureau should be connected with the Interior Department, in which is the Geological Survey, or whether it should be connected with the Department of Commerce and Labor. Those who advocate its connection with the Interior Department do so upon the theory that the investigations should be of a scientific nature. Those who advocate its connection with the Department of Commerce and Labor claim that the investigations should be of a practical or an industrial nature. Which, in your opinion, as a practical miner, would be of the most assistance to the mining fraternity, both from the standpoint of the operator and of the miner, investigations of a scientific nature or investigations of an industrial nature?

Mr. CRAIGO. I had never thought of that until I heard it talked of here, but it seems to me that investigations of a scientific nature would render all of us concerned more assistance. If this other is under the supervision of the Interior Department, it seems to me that this should be, that they both should be under the supervision of the same Department.

Mr. WILSON. If the bureau of mining is placed under the Department of Commerce and Labor, would there not be a greater tendency toward its giving attention to the commercial end of the mining rather than to the protection of life, limb, and property, than what there would be if it was under the Department of the Interior?

Mr. CRAIGO. If this other is in the Department of the Interior, the Geological Survey, it seems to me that you would do more good by having them both there than by having one under one and the other under another—one under the Interior Department and the other under the Department of Commerce and Labor. It seems to me as if they could work better if closer together; they could do more good than they could one under one Department and the other under another.

Mr. VAN HORN. From the questions asked by the gentleman, it seems to me that I must have been misunderstood. I do not want to be understood as saying that this investigation should be done just from a practical standpoint.

Mr. ENGLEBRIGHT. We did not understand you so.

Mr. VAN HORN. I did not mean it that way. I want the scientific investigation in order to assist those who have the practical knowledge. We have studied it for years, and, as Mr. Walker said, we have gathered what knowledge we could and gone as far in legislation as we can, until we get the scientific proposition on a basis where we can handle it.

Mr. ENGLEBRIGHT. I think we understood you thoroughly on that point.

Mr. VAN HORN. Just one word in addition to the gentleman from West Virginia. I might say there is a large amount of coal in Indiana lost from the very same reasons he says it is lost in West Virginia. We have eight veins of coal in Indiana. I do not mean by that that we have eight veins all in one place. We have No. 1 to No. 8. In many cases, though, we have two, three, four and five veins in one place, and there has been a great loss in Indiana in that respect already, and there will possibly be a great deal more. The desire is to get to the big vein; if there are two or three on top, mine it, because it can be mined cheaper and there will be an advantage in the market. That is the disposition in Indiana, and I presume that is the disposition in all other States.

Mr. ENGLEBRIGHT. I think this committee understands the question of the waste much better than they did this morning.

Mr. BARTLETT. You think, do you not, that in addition to the protective features of this proposed bill, such a bureau would be of very material aid in developing the mineral resources and mining enterprises generally, do you not?

Mr. VAN HORN. Oh, yes; yes, sir.

Mr. BARTLETT. You think it is a very important bureau for that purpose?

Mr. VAN HORN. Yes, sir; and very badly needed.

Mr. ENGLEBRIGHT. Of course we have been discussing practically coal mining to-day. What effect do you think such a bureau would have on other classes of mining?

Mr. VAN HORN. On metal mining?

Mr. BARTLETT. Yes; gold, silver, lead, and copper?

Mr. VAN HORN. I do not see that it could have anything but a good effect. It appears to me that work done on this line could hardly help benefiting the other trades.

Mr. ENGLEBRIGHT. Of course the miners in the West have been advocating a bureau of this kind for a great many years with a view, of course, of helping out the metal men. Of course they are anxious to join with the coal miners in having a bill passed which will include all the interests in one bill.

Mr. WILSON. I may say that the miners in the East have for a great many years desired a department of mines and mining, but they are modifying their position now, because they believe there is a greater likelihood of getting a bureau within one of the Departments than there is of getting a department. Something of the kind is absolutely necessary; so that we are simply modifying our plan, the desire to have a department, to having a bureau, because it seems to me to be more in practical lines.

Mr. VAN HORN. I may suggest, Mr. Chairman, to that that it does not miss the miners of the West, especially the Central States. We

believe, all of us, that we should have a law and handle the whole question—the entire mining question. The iron-ore mines of this country need something like that very badly, and they have a great deal to contend with in that respect. I am sorry to say that we are possibly trying to take the advantage that is given us to get relief in this direction through the terrible calamity that has overtaken us. That is what we are trying to do, without hiding it.

Mr. HALL. Can you tell us offhand what the percentage of these explosions is in coal mines as compared with explosions in metal mines—iron, gold, silver, etc.?

Mr. VAN HORN. I think they are much greater; I do not know: I could not give you the exact figures, but they are much greater.

Mr. HALL. Thus indicating that it is something pertaining to the properties of the coal?

Mr. VAN HORN. There are some in the metal mines, though, that are disastrous.

Mr. WILSON. Is it not a fact that the very nature of coal itself is more conducive to the explosion of gases than of iron or the other minerals?

Mr. VAN HORN. That is a fact known by everybody, I presume.

Mr. WILSON. I would say, so far as I am concerned, I believe that the bureau should be in the Department of the Interior. I have listened to the statements that have been made here this afternoon in connection with the matter, and I am firmly now of the opinion that it should be in the Department of the Interior. I fear that if it is placed in the Department of Commerce and Labor it will simply be used for the purpose of the extension of trade and the promotion of trade rather than for the protection of life, limb, and property, as it really should be. The most crying need, so far as the coal trade is concerned, is some means of securing information by which health, limb, life, and property may be properly protected in the coal mines, and at the same time that it is true of coal mining it would also, to a lesser degree, be true of mineral and quartz mining; and for those reasons I am now firmly of the opinion that the bureau should be established in the Department of the Interior.

Mr. BARTLETT. We are determined, of course, that the Geological Survey and this bureau should be in the same family. Now, then, as a matter of legislative expediency, do you not think it easier to put this bureau in the Department of the Interior than it would be to pass a bill removing the Geological Survey with this bureau into the Department of Commerce and Labor?

Mr. ENGLEBRIGHT. Notwithstanding the fact that Mr. Douglas asserted that the law creating the Department of Commerce and Labor provided that mining should be within its jurisdiction. The law that specifies that is not a constitutional law, and Congress may place a bureau within any Department, in which, in its judgment, it deems advisable to place it.

Mr. BARTLETT. I heartily agree with you.

Mr. CALBREATH. It occurs to me, as an additional reason to those that have been given, that the Department of the Interior is a department whose duties are greatly lessening as the territorial government of the country lessens. In that view of it, the time will come when the Department of the Interior will have little to do, while the

Department of Commerce and Labor will necessarily extend. We have for years been with you in demanding a department of mining. It may be that the feeling that no further department should be created will work out in this way, that finally the Department of the Interior will practically become a department of mining, and therefore it seems to me an additional reason why the Department of the Interior should have this extra bureau.

STATEMENT OF MR. F. J. DRUM, PRESIDENT OF THE MARYLAND MINERS' UNION.

Mr. DRUM. Mr. Chairman, I am from Maryland, which is a State to which explosions are foreign, such as these gentlemen have been talking about, and I think myself that the department that has been so much discussed to-day should be established for the protection of life, limb, and property. In my experience in the George Creek mines, and I have worked there for twenty-six years, the destruction of coal, in my opinion, is one of the reasons, along with the protection of life and limb, that this department should be established. I know from my experience in the time I have mentioned, in the mines, that there have been thousands and thousands of tons of coal destroyed in these mines, and of course if there had been a department of this kind to look after it, it seems to me it would have been a great benefit to the community at large, because, as time goes on, we find that this coal is very fast becoming extinct. I do not know there is much more I can say to you gentlemen in addition to what these gentlemen have said here to-day. I do not want to detain you any longer on the question. If there is any question that you would like to ask, I would be perfectly willing to answer it as best I know how.

Mr. ENGLEBRIGHT. Have you any gas wells in your locality?

Mr. DRUM. No, sir.

Mr. BARTLETT. You agree generally with the statements made by the other gentlemen?

Mr. DRUM. Yes, sir.

Mr. BARTLETT. I guess we are all a unit.

Mr. HALL. Evidently, one of the principal questions that this committee will have to determine is whether this bureau should be connected with the Interior Department, in which is located the Geological Survey, or whether it should be connected with the Department of Commerce and Labor. Those who advocate its connection with the Interior Department do so upon the theory that the investigations should be of a scientific nature. Those who advocate its connection with the Department of Commerce and Labor claim that investigations should be of a practical or an industrial nature. Which, in your opinion, as a practical miner, would be of the most assistance to the mining fraternity, both from the standpoint of the operator and of the miner, investigations of a scientific nature or investigations of an industrial nature?

Mr. DRUM. I should think it ought to be connected with the Interior Department, because of the fact that the department looking after the scientific part and the department looking after the practical part ought to be together.

Mr. HAMILTON. Would there not be some danger of the whole thing becoming scientific and losing sight of the practical side of the thing, if you get into that?

Mr. DRUM. It seems to me that it ought to be fixed so that that could not be.

Mr. HAMILTON. That, as I understand, is Mr. Douglas's position, to put that into the Department of Commerce and Labor along with this bureau now being established.

Mr. DRUM. As I understand it, they will be under the Interior Department, but both distinct, and they would help each other out. That is my idea of it.

Mr. WALKER. Mr. Chairman, the miners and the operators, as the thing stands now, are both, I think, about as thoroughly informed on the practical phase of the situation as they can get to be. They will all be here while this bureau is in operation, and any scientific propositions advanced by the bureau that are founded on false premises will, I think, be exploded very quickly, before they are enacted into law. I expect both sides would be asked to appear before committees that had those things in charge.

Mr. HAMILTON. The question is this, Mr. Walker, as I understand, as to the two different theories. We have four bills, one from Mr. McHenry, one from Mr. Englebright, one from Mr. Douglas, and one from Mr. Chaney. Mr. McHenry's and Mr. Douglas's bills both provide that the bureau shall be made a bureau in the Department of Commerce and Labor. The other two provide that it shall be a bureau in the Department of the Interior. As I understand the views of the gentlemen who think that it ought to go into the Department of Commerce and Labor, it is just that fact that determines their minds, that we want a bureau which will go into the practical side of the matter so that it will not become overshadowed by the scientific investigations.

Mr. WALKER. The scientific theory is one that is founded on a correct premise, and if it is not founded on a correct premise, it is neither scientific nor practical.

Mr. HAMILTON. It is true, as a matter of fact, that science very often has to succumb to the practical knowledge of a man who has been there.

Mr. WALKER. Science only succumbs, when you try to put it into practical operation, when it is founded on a false premise.

STATEMENT OF MR. JAMES PURCELL, OF CLEARFIELD, PA.

Mr. PURCELL. Mr. Chairman and gentlemen of the committee, like my friend Drum, I have been raised in the coal-mining industry, where we have not had very much gas in the mines, and consequently very few, or very rare, explosions. I have neither a practical nor a scientific knowledge of gases, as I was always considered too much of a coward to go to work in any place where there was any danger from the effect of those gases exploding. At one time in our field, I remember, I think it was in 1888 or 1889, I worked in a mine where they claimed that there was a dust explosion. I did not happen to be there when the explosion occurred, but I worked in the mines afterwards and whether it was a dust explosion or what caused the

explosion has been a mystery to me. But there has not been an explosion in the mine since, and it has been working practically every day, and there have been no precautions taken other than what had been taken previous to the explosion. In our State, which is close to the seaport towns, naturally a great many foreigners, when they come to our country, are taken into the coal region, and I believe that I would be pretty nearly safe in saying the same as those other two gentlemen have said, that there is not a practical coal miner in our particular part of Pennsylvania who lives up strictly to the letter of the law.

Mr. HUFF. Why do you not enforce the law?

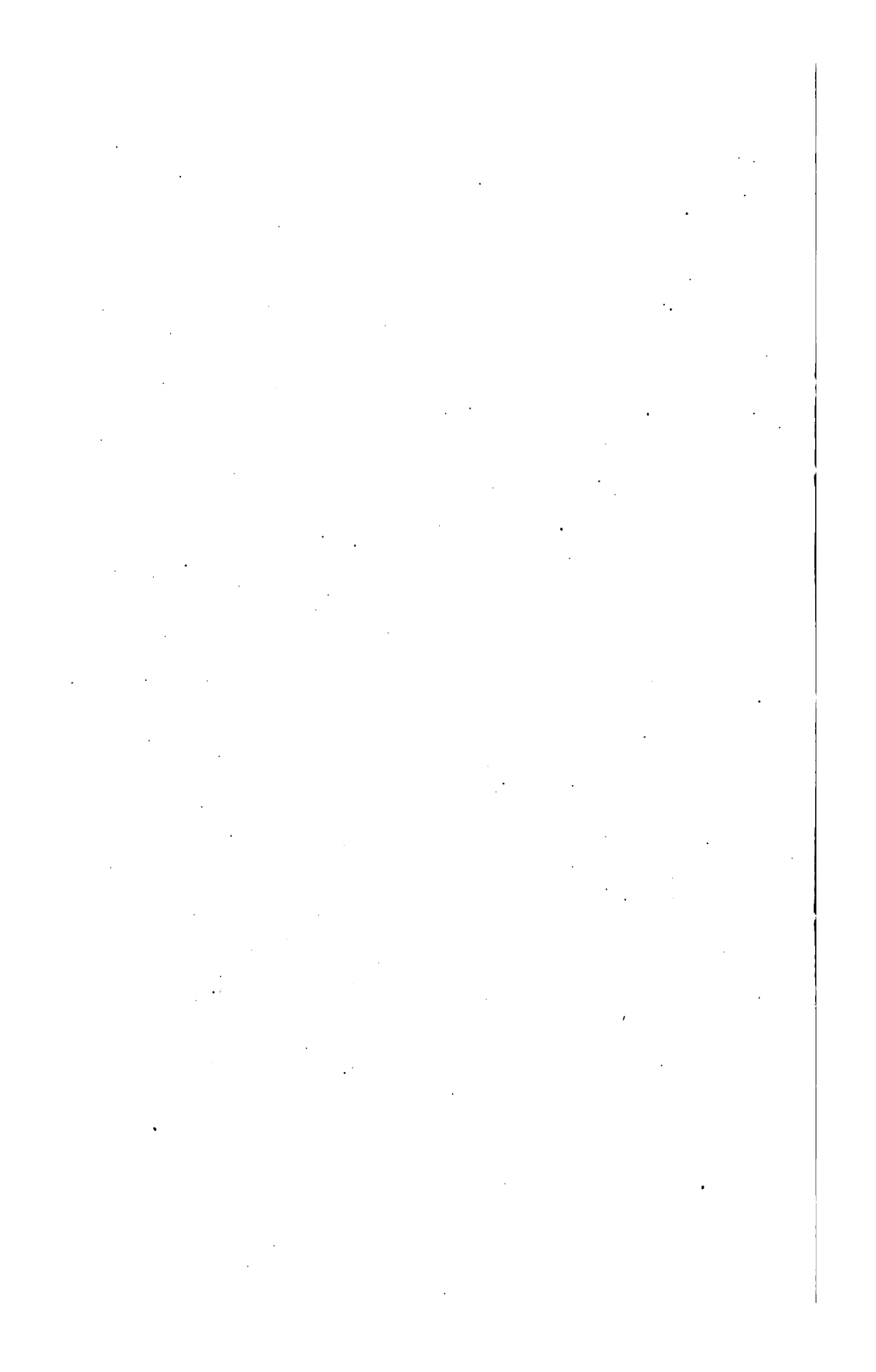
Mr. PURCELL. I might ask you the same question.

Mr. HUFF. We do.

Mr. PURCELL. You would be in a better position than I. The law requires, as my friend Mr. Huff will admit, in central Pennsylvania, that no man shall have a place to work unless he is capable of taking care of himself. I believe I am safe in saying that in a great many instances, pretty nearly all the operations, and I believe in Mr. Huff's operations, if they do not hire those foreigners when they come there and put them in a place to work regardless of the fact that they are not able to take care of themselves, it is an exceptional case. The last legislature we went to Harrisburg and tried to have a law enacted for the benefit of the miners in the gaseous mines in Pennsylvania, and we tried to have a competent law passed, that a man before he could be required to work in the gaseous mines should stand an examination as to his competency, would have to have practical knowledge of mining before he would be allowed in those mines. We were unable to get the bill from the committee, and I do not know whether, if the bill had been passed and put into effect, it would have stopped some of the explosions that we unfortunately have had since that time. I, like the rest of them, believe that if there is anything that can be done by Congress to reduce the percentage of people being killed and maimed in the mines throughout the United States, whether it would be through a bureau of this kind or some other way, I feel, as a representative of the mines and the citizens of the United States, that it should be done.

I do not know that I have any more to say. In regard to this question as to where it should be placed, I believe it ought to be placed in a way so that when there is any examination as to the causes of those explosions that it should neither be left to the practical side nor to the scientific side to judge; but I believe it ought to be judged by both of them, and I think, if the bill is passed, it ought to be arranged so that when those examinations are made both sides would be parties to the examination, whether it would be in the Department of Commerce and Labor or the Interior Department. I believe that it ought to be so that when there is any examination made both of those would be there at the examination and each side give its view, both the practical and the scientific side of it.

(Thereupon, at 5.10 o'clock, p. m., the subcommittee adjourned.)



ESTABLISHMENT OF A BUREAU OF MINES.

COMMITTEE ON MINES AND MINING, HOUSE OF REPRESENTATIVES, *Thursday, March 12, 1908.*

The subcommittee having in charge the several bills bearing upon the creation of a bureau of mines was called to order by Representative Englebright, chairman of the subcommittee.

Members present, Mr. Englebright (chairman), Messrs. Hall, Douglas, and Hamilton.

Representatives Huff, Beale, Howell, Foster, and Chaney.

Mr. ENGLEBRIGHT. We have called a meeting of the subcommittee of the Committee on Mines and Mining for the purpose of giving you gentlemen an opportunity to express yourselves on the feasibility of creating a bureau of mines in some Department of the Government, and I might say right here that it seems to be the general sense of the committee that such a bureau should be created. What the committee is particularly desirous of having information on is as to the question of what should be the scope of this bureau, what particular matters it should take up, and some of the reasons why such should be done, that they may be able to clearly set forth, when they prepare a bill, why it was prepared. So we will be pleased to hear from any of the gentlemen present.

STATEMENT OF MR. G. W. TRAER, OF THE ILLINOIS COAL OPERATORS' ASSOCIATION.

Mr. TRAER. Mr. Chairman, the gentlemen who accompany me are representatives of the coal-mining industry in Pennsylvania. The committee is composed of two gentlemen who are not present yet, but whom we are expecting every moment, Mr. J. C. Kolsem and John K. Seifert, representing the Indiana Coal Operators' Association; Mr. John H. Jones, Mr. S. A. Taylor, Mr. W. W. Keefer, and Mr. J. Frank Tilley, representing the Pittsburg coal operators and Pittsburg Chamber of Commerce. Mr. Taylor also represents the Mining Institute of America, and Mr. Jones the coal-mining interests in Ohio, West Virginia, and Kentucky. For myself, I represent the Illinois Coal Operators' Association, which includes in its membership practically all of the tonnage of the State, nearly 300 coal mines, with an output last year of some 46,000,000 tons. This committee altogether represents an aggregate tonnage of coal mines in the States and districts which I have mentioned amounting to about 100,000,000 tons of coal.

Our committee is unanimously in favor of the establishment by the Federal Government of a bureau of mining technology, as proposed in bills now introduced, the purposes of such a bureau being for the investigation of the problems which have to do with the increasing of safety and efficiency in mining and the promulgation of results for

the benefit of the mining industry and the general public throughout the entire United States. The committee is of the opinion that such a bureau should be established by the Federal Government for the following reasons:

First, because the mining industry is a great national industry, like agriculture, upon which the Federal Government now spends about \$12,000,000 a year for colleges, investigations, stations, and so forth, in the different States.

Second, that if this work were done or attempted to be done by the State there would be endless, or a great deal of duplication. Thus far the States have neglected or omitted to make any investigations of this character, and if they were undertaken by the various thirty coal-producing States—I am speaking now from my point of view as a coal operator and with reference to coal operations only—there would be almost endless and very costly and unnecessary duplication. The scope of investigation by individual States would almost necessarily—in fact, I may say necessarily—be limited in financial resources compared with the Federal Government, and the work by the States also would be limited in its possibilities largely within the boundaries of the State, whereas these investigations ought not only to extend over the entire United States; in our opinion, they should even extend to what has been and what is being done by foreigners who have done a great deal of valuable work upon these subjects.

Investigations by private corporations would necessarily be even more limited in their financial resources and scope than investigations even by the States, and especially as compared with the Federal Government. Private investigations, further, would be open to what appears to us would be a fatal objection, in that the results obtained would not be accepted by the general public with the same faith and credit as results obtained by the Federal Government. The economy of the total amount of work done would be immensely promoted by its being done by the Federal Government, because of the avoidance of the duplication of work which I have already spoken of, and would further insure that everybody throughout the United States received the results of such work in all States and Territories, and the general public would be much more inclined to accept such results and utterances as impartial and authoritative.

While it is impossible to determine with perfect accuracy, or perhaps with any considerable degree of accuracy, what increase, if any, there has been in the percentage of fatal and nonfatal accidents in comparison with the tonnage of coal produced, or the number of men employed, on account of the methods employed in the securing of statistics, it is certain that in the territories represented by this committee who are present before you the production of coal at the present time is approximately three times as large as it was ten years ago. There has been that much of an expansion and increase in this industry in this limited portion of the United States. This rapid and tremendous expansion and the tremendously increased intensity of competition, which can not be realized by anyone not engaged in it, and the reduction in the hours of labor which has occurred in the last ten years, have forced a similar intensity in the operation of mines in the way of larger outputs, constant effort to increase individual outputs of mines, necessitating a much greater number of men employed in the single mines and the use of a greater amount of machinery.

Particularly in the mountainous regions, the liability of the occurrence of gas increases with the increasing depth below the surface and distance from the output, and these features are increasing in some districts in the actual operation of mines. Then methods of doing their work by individual employees, individual miners, have changed more or less of late years with the effect of causing an increase in the danger to such men and their fellow-employees, and in a general way the mining conditions have been more complicated and intensified for the reasons I have given in detail.

The problems arising out of the conditions referred to require scientific investigation and research of a sufficiently broad scope over the entire United States. This committee believes that the investigations of a national bureau of mining technology as proposed would tend to materially reduce the number of mine accidents in the United States by increasing the knowledge of persons connected with the industry as to the causes of many of the accidents. Much is now given over to surmise and conjecture, and there is a great deal of credulity as to supposedly mysterious causes for certain things which happen, but there is not a sufficient body of accurate scientific knowledge to meet conditions like that. The conclusions of a bureau such as it is proposed to create, and their suggestions, undoubtedly would be widely accepted and attempts made to carry them out. They would be received with respect both by the owners of the mines and by the miners and mine laborers themselves.

The committee is of the opinion that the work of such a bureau should not have anything to do with the extension and supervision of practical mining operations, but that the work of such a bureau should be wholly that of a bureau of investigation and research, for the purpose of experimentation in securing information and in publishing the results of the work of the bureau for the benefit of the mining industry and of the general public. For ourselves, we have no fear that the work of such a bureau would encroach, or be thought to encroach, upon the prerogatives of the States to the extent of becoming a Federal bureau for the extension of supervision of mines; we believe that the several States can be trusted to guard their own constitutional rights in that respect. All of the States represented on this committee now have State mining departments for the inspection and regulation of mines, but none of these States have entered upon the lines of investigation proposed to be conducted by this Federal bureau, and there is no apparent tendency in that direction in the States.

We believe that such investigations by a Federal bureau of mining technology properly conducted, as it is only fair to presume they would be, would be beneficial to the States in connection with the enactment of further proper laws in relation to mining, and would also be beneficial to mining companies in assisting them in the understanding of their problems and in formulating rules and regulations for safeguarding the lives of the men employed. The results of the investigations of a Federal bureau of mining technology into the causes of these great, overwhelming mining disasters would furnish a source of reliable statements of facts for the information of the public and would assist mine owners and miners in taking measures for the prevention or recurrence of some accidents. It is our belief that the making available of reliable and accurate knowledge in relation to

such mining disasters would be useful to the courts themselves in rendering decisions, because of the fact that it would make possible the securing of more reliable and better grounded evidence than it is usually possible to secure in the case of all sorts of mining accidents, especially the great, overwhelming accidents.

Our committee is unanimously of the opinion that the proposed bureau should be placed under the Department of the Interior. The organic act establishing the Department of Commerce and Labor provides that it shall be the province and duty of said Department to foster, promote, and develop the foreign and domestic commerce in the mining, manufacturing, shipping, and fishing industries, the labor interests, and the transportation facilities of the United States. The purpose of the Department of Commerce and Labor seems to be indicated by its title, that is, to promote and develop the commercial and labor interests. While the jurisdiction of the Department of Commerce and Labor may properly attach to questions relating to the commercial phases of business, the business of mining, and perhaps to the relations between labor and capital in that business, it does not seem to us to properly attach to the scientific investigation of subjects relating to the nature of mining and the technological problems connected therewith and the dangers involved. The Department of the Interior appears to have been in contemplation of Congress the proper Department for the investigation and handling of such subjects. This would appear from the fact that the control of the mineral lands of the public domain has always remained with the General Land Office under the Department of the Interior.

The control of the mining and the control of the mineral lands belonging to the Indian is under the supervision of the Indian Office in the Department of the Interior. The regulation of the mining laws and the enforcement of laws and regulations for the protection of lives of miners in the Territories is in the Department of the Interior; and the further fact that the investigation of ore deposits, the nature and extent of coal fields, and the collection of statistics relating to the mining industry in the United States are in the Department of the Interior.

Mr. Chairman, these are the ideas which have occurred to us in the consideration and the discussion of this matter. We do not assume that it covers the ground or that it covers all the questions which may be in the minds of the members of your committee, but it covers these questions so far as they have occurred to us at the present time and the members of our committee will be very glad, indeed, to respond to questioning on the part of the chairman or members of your committee if you should so desire. I thank you for your attention, gentlemen.

The CHAIRMAN. We should be pleased to hear from you, Mr. Jones.

**STATEMENT OF MR. JOHN H. JONES, REPRESENTING THE
PITTSBURG COAL OPERATORS AND THE PITTSBURG CHAMBER
OF COMMERCE.**

Mr. JONES. Mr. Traer has covered the position of all the operators present, unless there are some thoughts you wish to draw out of us individually.

Mr. ENGLEBRIGHT. There are probably a few thoughts on which we would like an expression of opinion, and one is this: In the hear-

ings we have had so far, both from mine operatives who have been here and representatives from the different labor unions of the different States, the proposition has been advanced that the causes of these horrible coal mine accidents we have been having are practically unknown at the present time, so far as people who are posted on that subject can agree. What have you to say as to that phase of the question?

Mr. JONES. I think that is true. You get a good many experts together and they will have different opinions. I have heard men who have been in the business all their lives say that dust would not explode, take the positive position that dust would not explode. You can get together several in the same body of men who will say that dust will explode. Some will say that it will not explode unless it has a certain mixture of gas with it, and some say it will not explode even with that. So if we have this bureau of investigation, and they test these different mixtures, it will demonstrate to the mine management just what they have to fear. If dust will not explode, then it will be unnecessary for us to take certain steps; if it will explode, then it is necessary to take certain steps which have been advised. If it will explode only with a certain mixture of gas, then we should know what that mixture is. We have no way at present of knowing. I venture to say that if you got a dozen practical, thoroughly practical, mine managers together in one room I would be surprised to see one-half of them agree on the causes necessary to bring about an explosion. So, of course, under those conditions we are groping in the dark, and naturally we look to the Federal Government to tell us just what the trouble is.

We are operating in Pennsylvania, Ohio, West Virginia, and Kentucky. It would be much easier for us to contribute our mite toward the Federal Government making these tests than it would to contribute our mite to four separate States who, to get the proper officials, would have to spend as much money in each as the central testing laboratory would have to do to get the same efficiency, and for that reason I think this bureau should be established at the very earliest possible moment.

Mr. TRAER. Mr. Chairman, if you will permit me, in reply to your question as to the causes of these disasters, there are many things which, taken by themselves, mining men will pretty well agree as to what each particular thing will do by itself. For instance, mining men will agree that a certain mixture of marsh gas with air will cause an inflammable and explosive mixture known as "fire damp." They know pretty well what the percentage of mixture must be. They know pretty well what the character of coal dust is, the fine, impalpable dust. It is known perfectly well that it is combustible, and that under certain conditions it is quickly combustible. They know that under certain conditions it, by itself, will do certain things. They know also pretty well, and will agree fairly well, what the action of the combustion of black blasting powder is when it undergoes that perfect combustion which we call a perfect shot, or perfect explosion, and does its work as it should, blowing the coal off by expansion, and they will also agree pretty well as to what the general character of the mixture of gases and substances is which are ejected into the air of a mining place where a blast, instead of undergoing perfect combustion in the hole, and perfect expansion,

is belched out into the air of the room like a charge of powder from a gun, uncombined chemically, and the chemical reaction or combustion taking place in the room. They know pretty well what the results of that taken alone will be. But they can not agree as to what the relation of these various causes is to these great disasters, these great mine explosions. They will agree fairly well that in most cases perhaps each one of them has something to do with it, but what their relative importance is is not known and is not agreed to in the slightest degree.

Like Mr. Jones, I not only believe, but I have heard men who were called experts, both as practical miners who had grown up in the business, mine managers and mine superintendents and others, argue indefinitely upon these questions, as to what relative weight those causes bore to the cause of an explosion. That is the chief difficulty in regard to great explosions. It is rarely agreed that even fire damp alone is solely responsible for one of these great disasters. It is never agreed that coal dust alone is responsible for it. I believe it would be unanimously agreed that as an accessory after the fact the fine coal dust in the air would continue the effects of an explosion, the inflammable effects of an explosion. I have heard that often discussed, and it would doubtless be agreed generally that that was true. It would never be agreed among any given number of mining men that the improper explosion of charges of powder alone would cause all of the results which occur in these great explosions, but it would be most tenaciously maintained by many men of long experience and observation that they not only contributed greatly to them, but in many cases were the originating cause which was afterwards merely accelerated by the addition of the other causes.

That is the problem—the confusion of minds in regard to the relative importance and the action and reaction of these various causes upon each other.

Mr. BEALE. Is it not also argued that the impurities in coal which cause these different explosions in different mines are entirely different—that is, what would be explosive in one mine would not be in a mine of different coal? What has been the experience in regard to that?

Mr. TRAER. There are vague surmises in the minds of various persons about questions of that kind.

Mr. BEALE. Some coal has much more sulphur in it than others?

Mr. TRAER. Yes, that is true; but sulphur of itself is not explosive in the sense that it is quickly inflammable—enough to cause an explosion. The explosive agencies, or the agencies which contribute to the forces of these explosions, are inflammable gases like marsh gas, commonly called CH_4 ; carbon monoxid, CO , which also when mixed with a certain quantity of air becomes very explosive, and the fine particles of pure coal itself, which, while not explosive in the generally accepted sense of that term, are quickly inflammable, and in the presence of a sufficient degree of oxygen to make the chemical reaction of combustion and a sufficient degree of heat it will inflame quickly into a flame and prolong the flame of an explosion originating from other causes. But take the impurities, those things which are called impurities, in coal, the sulphur and the slate, or slaty matter, bony and earthy matter, while sulphur is inflammable, those others

are not even inflammable, but are absolutely inert even in the presence of fire.

Mr. BEALE. Under certain degrees of heat, however, it creates a substance which is inflammable?

Mr. TRAER. If sulphur combines in the presence of oxygen in a sufficient degree of heat, in what is called the chemical reaction, which is called combustion, yes.

Mr. HOWELL. Then the conditions of mining coal in this country are exactly the same as conditions in other countries in respect to what produces these disasters?

Mr. TRAER. The natural conditions unquestionably are the same. There coal is simply in a different part of the world, in which it meets with certain varying conditions, but only variations of about the same conditions.

Mr. HOWELL. Are you informed as to what has been done by European countries with regard to discovering the causes and supplying remedies for these things?

Mr. TRAER. No; I only go by the conversation among mining men; that the European countries have applied themselves to such subjects upon a scientific basis, as it is their custom to do, particularly chemical subjects, but I have no personal knowledge in detail as to what they have done.

Mr. CHANEY. I would like to ask the gentleman a question. I did not get in to hear all of his argument. I heard him say that he felt that the Geological Survey was the right place to put this bureau.

Mr. TRAER. Pardon me, I said that we believed it would better be under the Interior Department, either coordinate or adjoining bureaus, you might say. The Geological Survey is a bureau whose purposes are explorations, the discovery and determination of the modes of occurrence of mineral coals and the treating of the chemical phases of their occurrence and their value for operation, but I am quite familiar with the work of the Geological Survey as a bureau; that is, I have seen a great deal of it, and have made use of a great deal of it. I understand it to be confined to those subjects and not to be of a technological character other than the analysis of the coal they find, and some of the other minerals, and not to relate to the chemical character of the problems involved in mining coal. I do not understand that the Geological Survey has to do with those, and I do not know that they are even equipped for it.

Mr. CHANEY. Do I understand you to mean that the bureaus might work in coordination?

Mr. TRAER. I should think so; I should think that each might supplement the work of the other.

Mr. CHANEY. Do you think it is possible to ascertain the causes of these troubles that have been mentioned in mining coal?

Mr. TRAER. I believe it is possible to determine some of them; human knowledge, perhaps, will never become perfect in that department more than anywhere else.

Mr. CHANEY. Do you think it is the duty of Congress to undertake to ascertain the causes of these troubles?

Mr. TRAER. I do.

Mr. CHANEY. What is the reason you give for Congress taking up this work rather than the States?

Mr. TRAER. I stated that in the statement I read.

Mr. CHANEY. Do you think it is necessary to have a permanent bureau?

Mr. TRAER. Yes, I do. The education on this subject will never be complete.

Mr. CHANEY. Suppose we get through with the investigation about the troubles resulting in these explosions and losses of life and property, and so on, which brought this matter to such an acute point; then what will they have to do after that is over?

Mr. TRAER. There will always be subjects to investigate. No two explosions ever have occurred exactly alike, probably no two, and as the magnitude and the intensity of the work of mining increases—I am speaking now of mining coal—there will be new questions arise, new problems, compared with those we have before us now, just as there have been in the last decade or two, new problems, different from those we had before us then. Then the Federal Government is a large owner of coal lands and probably intends remaining so, lessor, and there will always be questions relating to the chemical character of those deposits, the working of mines by the lessees of Government lands.

Mr. CHANEY. Another question: Will the scope of the bill proposing to constitute this bureau in the Interior Department in connection with the Geological Survey embrace all that you would embrace in the investigations and educational work necessary to make this bureau effective?

Mr. TRAER. Do you ask me whether the bill now proposed does that?

Mr. CHANEY. Yes; take my bill there and read it and see whether we have it broad enough.

Mr. TRAER. Yes; I believe it is; I think the language, of necessity, must be general, because if you attempt to specify details you limit it.

Mr. CHANEY. Of course, the purpose of the bill is to make it broad enough, and I just thought that if you gentlemen who had studied the question would give us the information we could speak with a little more positiveness when it comes before the House.

Mr. TRAER. I have read your bill, Mr. Chaney, and to me it appears sufficiently explicit. The language is general and broad, but I believe it must of necessity be so, and the term "mining technology" is sufficiently explicit; it has a recognized meaning among scientific men.

Mr. ENGLEBRIGHT. Before you leave this explosion question I want to ask just one question, and it is this: We have some statistics which show that the number of men killed in the coal mines in the United States for each thousand men employed in the year 1895 was 2.67; in the year 1906 this percentage had increased to 3.40. These figures seemed to be just reversed in Europe. For instance, in Belgium, from 1881 to 1890 the figures show 1.99 men per thousand, while from 1901 to 1906 there was only 1.02. In other words, the figures in Europe just reverse the figures in the United States.

Mr. CHANEY. They have decreased and we have increased.

Mr. ENGLEBRIGHT. What conclusion would you draw from that?

Mr. TRAER. Mr. Chairman, I would not undertake to explain it wholly, but I feel sure that to a very large extent it is explained by

the expansion of our industry within ten years to three times the size it was ten years ago. Nothing in the United States has expanded with any greater rapidity than the business of mining, and ten years in the development of an industry which involves many complicated and not well-known chemical questions is a comparatively short time, after all, and the expansion of three times within ten years will explain a good many things in the way of imperfect work, imperfect effort, and imperfect organization. Under those conditions it is probable that the disseminated knowledge throughout the whole people engaged in coal mining, employers and employees alike, is nothing like as perfect as it is among the Belgians, who probably have expanded little, who are a homogeneous race, have been engaged in coal mining there son after father for several generations. There probably may be other reasons, but I think those are some of the reasons.

Mr. SEIFERT. If you will just allow me to add one thing, I think I can say something on that which will give some light. That is, ten years ago we were not compelled to keep the record of the people hurt and killed, and I think it will more than account for the difference in the number of people on record in late years as being killed and being hurt. That has a great deal to do with it. I know it has in my own experience. I have been in business since I was 17 years of age, and I have been in a position where it was my duty, as far as it went, to look after all these things, and I know that ten years ago we did not keep an account of a man having his toe stamped and made black and blue, and have it reported to the mine inspector and paying \$5 to the doctor to have it wrapped up. They were not treated in that way in those days, and I think that will account for all the difference in our percentage of fatalities or injuries.

Mr. CHANEY. While you are talking, may I ask you, have the operators made their best efforts to discover on their own account these troubles and the causes of the disasters?

Mr. SEIFERT. Yes, sir; I can say for our people that we have made every effort we knew how to make, although we do not have the appliances and the opportunities to go into the fine work in these things, but so far as observation is concerned and so far as preventives in the way that we could apply them about the mine, such as keeping a good circulation of air, and all that sort of thing, a watchful fire boss, and so forth, we have taken those precautions and insisted on them to a degree that sometimes would get us into trouble. Over half of the accidents, however, occur from men doing things in spite of absolute notice not to do them.

Mr. ENGLEBRIGHT. You need not comment on this unless you want to, but the operators say the trouble is with the men, and the men say it is the operator dodging.

Mr. SEIFERT. Yes.

Mr. ENGLEBRIGHT. My own individual opinion is that in different cases you find both reasons.

Mr. SEIFERT. I think that is true, sir, absolutely. For instance, we have a pit boss in charge of a mine. Something will happen in it. On investigation we will find that the man was at fault; he was careless or overanxious to accomplish something, and in those cases that would be looked upon as the fault of the company, while it was not the fault of the people who own the property and the people

who want these things right at all, but it is on account of having people to do your work who do not do what they should do.

Mr. HOWELL. What proportion of the disasters that occur can not be traced to a direct cause—that is, you have stated now causes which tend to produce accidents in mines, but how many accidents occur of which you can not directly trace the cause?

Mr. SEIFERT. There are not very many.

Mr. TRAER. They are the explosive accidents.

Mr. SEIFERT. They are the fearful explosions that lead to something we do not know how to account for.

Mr. TRAER. Many small explosions, where single men or a few men only are injured, or sometimes killed.

Mr. HOWELL. Do I understand, then, that in the mining of coal you do not know at any time when you may have an explosion?

Mr. TRAER. Not absolutely.

Mr. SEIFERT. Very frequently that is true; very frequently you will strike a blower in a coal mine that will deposit a bunch of gas at a place where you least expect it, and a place where the miner least expected it, but that is usually a thing that is not very serious and does not lead to any general or horrible result. You have a few men slightly burned, or something of that kind.

Mr. HOWELL. That could be easily detected, could it not?

Mr. SEIFERT. Yes; it is usually detected by our fire boss and usually marked, but even after that an accident will occur right at that place.

Mr. HOWELL. So that after all it seems that if there is proper care taken you can determine when you are liable to have an accident?

Mr. SEIFERT. No; because you can go into many places in a mine now and go in thirty minutes afterwards and you would have an explosion there when you did not dream of it.

Mr. HOWELL. But if you were there when it occurred, you would be able to detect it and prevent it?

Mr. SEIFERT. Yes, sir.

Mr. TRAER. Not necessarily; you might precipitate it and be the victim of it.

Mr. SEIFERT. You would, if you were not there prepared to meet it.

Mr. TRAER. To answer the gentleman's question as I understand it, it is not possible to previously detect, in many of the cases, the causes which combine to bring on these accidents. No operator would willingly permit the continuance of conditions which he should reasonably expect or might reasonably expect would result in an explosion, even if he were sufficiently careless of human life to do that; he would have that regard for his property which would lead him to avoid it.

Mr. HOWELL. The thought in my mind was how it would be possible by any process of investigation to guard against such contingencies as have been suggested.

Mr. SEIFERT. To try to ascertain the combinations of causes which lead to these explosions. The fact is now that the cause of the disaster or the causes or the combination of causes are a subject of dispute; it is not known just how they arise, but it is hoped that by the investigations and study of men qualified to make such researches, they may bring to light knowledge that will make it possible to go a great ways in detecting in advance these causes and preventing the explosions.

**STATEMENT OF MR. W. W. KEEFER, REPRESENTING THE
PITTSBURG COAL OPERATORS.**

Mr. KEEFER. I will answer Mr. Chaney's question from the standpoint of my own experience. Like Mr. Seifert, I have been engaged in the business from childhood. My company mines nearly 8,000,000 tons a year and has never had a serious explosion. Occasionally small explosions have occurred, but they have not been general in character and the loss of life has been very small. All of these recent disasters we have investigated from our standpoint faithfully and as carefully as we know how. We have our own individual opinions as to the causes of these various disasters, the initial causes, but we probably now do not agree as to the actual combination of causes or conditions that brought about these horrible and overwhelming disasters. It is with the idea in view that some technological bureau, some body of experts who devote their time to this problem, can be established, that we are seeking just this result. We are free to confess that we are unable to agree with other people as to any of the causes and conditions that have brought about these horrible explosions; we would like to be advised; I believe everybody has the same general view of the problem.

Mr. CHANEY. I would like to ask, Mr. Seifert, do you think it is possible or practicable for the operators and miners, separately or independently, to get together and discover on your own account these various causes of mine disasters and the like, or do you think that it is an impossibility?

Mr. SEIFERT. I think it is impossible as individuals or companies to accomplish that thing, for the very reason Mr. Keefer gave, that he and several others and myself, going to a place of that kind, would take up all the evidence we could find and all the facts we could see, and then we would sit down and disagree about it. A body of men such as this commission would be composed of would go right on the ground and stay on the ground and make actual tests and investigations regardless of costs or consequences, until they had arrived at that particular thing. I believe that is the only way it will ever be arrived at.

Mr. ENGLEBRIGHT. You did not mean a commission; you mean a regularly organized corps?

Mr. SEIFERT. A regularly organized corps of experts to follow up that particular question and get to the bottom of it.

Mr. CHANEY. Suppose we get on the floor of the House of Representatives with this bill asking for its passage, Mr. Keefer, and somebody gets up and asks Mr. Englebright or myself the question, "What is the reason the operators do not get together and engage some experts to study this question and advise them, instead of asking for a bureau to be established for this purpose?" What kind of an answer would you say we should make to that question?

Mr. KEEFER. I do not know exactly how you should answer the question, but I would answer it to you this way: If Mr. Jones and myself were to engage an expert or a corps of experts to make investigations, they would be made wholly with a view to studying the conditions with which we are familiar, with which we are engaged every day, without any regard to the conditions under which Mr. Traer or Mr. Seifert are working, and the conclusions drawn would be drawn entirely from the conditions they studied.

Mr. CHANEY. Suppose that all of you were to get together and agree upon the necessity of discovering all these troubles?

Mr. KEEFER. If we all got together, I fancy we could get the same results as the technological bureau, but all getting together amounts to the same thing as Congress doing it.

Mr. CHANEY. Would you consider it impracticable for those interested in mining to get together and to engage somebody?

Mr. KEEFER. I should certainly think so. If there was any leaning at all, it would be a leaning toward making reports for the people who engaged them, who would be the operators. The technological bureau would be making a report for the people of the United States.

Mr. TRAER. Including the miners.

Mr. TAYLOR. There is another reason that would add to that. Some years ago I remember being employed with several other gentlemen to appraise a lot of properties, and five or six values were put on them. After we had brought in our report the gentleman who had the appraisal made said if he had it to do again he would put one man on and let him appraise all the properties. If you take each operator in each district and each miner in district, he will decide certain things which will be of no value—say in Pennsylvania, in Ohio, or other districts—not exactly as strong as that; they would be of some value, but would not be of any absolute value, such as the results obtained by a technological bureau.

Mr. KEEFER. Mr. Chairman, I would like to add that, so far as the coal operators are concerned, we are not seeking anything for the coal operators; it is for the industry and the public generally. We believe it would be just as beneficial to us as to anybody, but no more so.

Mr. KOLSEM. You see there is one thing about the coal business which differs so much from the other businesses of the country that if the companies made the investigations they would all make investigations on the conditions in their own property and from the standpoint of their own methods of treating it, and they are all different; one company would naturally think that their investigation must be right, they have had pretty good luck and very few accidents, but they never would get together.

Mr. JONES. With reference to gases, we do know what they will do; we do know what percentage of air it takes to make the greatest explosion. What we want this bureau to tell us is whether a certain amount of dust and a certain amount of gas—what proportion it will take to make the explosion, and to go into the thing generally and advise the general public and the operators and miners what they should do to prevent those explosions. There are some of us who think we know, and a dozen of us bring our mine bosses in every month and talk it over, and those mine bosses are all competent men; they have certificates of competency from the State, and I know that if you take a vote of those fellows they will divide up even on those things. Any practical man can go into a chamber in a mine and tell with his safety lamp how much gas is there and whether it is in an explosive state, and he goes each and every morning around through the gaseous mines—that is, the fire boss—and makes investigation. If he finds that gas is there in dangerous quantities he bars off that portion of the mine and sends the men home until it is removed, if it can not be removed instantly. But there is a great deal of difference of opinion as to what caused our recent explosions.

Mr. CHANEY. What explosion do you now refer to?

Mr. JONES. I mean such as the Monongah and the Darr. They may have been caused by a small body of gas igniting and that flame igniting the small particles of dust floating through the air. They may have been caused by gas accumulating on falls and the fall coming and pushing it out. There are a number of ways in which it could have happened. I do not know, and there are a great many people who do not know, and I do not think that anybody really does know what caused the accidents. If we had this bureau, they would make examinations all over the United States and they would inform us. You say, "Why do not the operators make the investigations?" Within the last six months we have spent \$25,000 trying to adopt remedies which we think will help to prevent accidents. I do not know whether we will or not. We are putting sprinklers into some of our mines. Some people say, "You can sprinkle the dust, and if you will blow it you will find that the dust is still there on top of your water." Of course by having a hose and washing the sides and the roof you would get rid of that dust. Through this department you ought to have an examination made of the air in the mines and the small percentage of gas in the air which is possible to detect; you get enough air to dilute the gas, or you can have a mixture of air with a large body of gas and the gas will not explode. You have to have a large quantity of gas or it will not explode.

Mr. CHANEY. You think, therefore, it would be impracticable for the operators and miners, together or separately, to make the investigations?

Mr. JONES. I think so; yes, sir.

Mr. TRAER. Is it not a fact, Mr. Jones, that the miners would not accept the results of the operators' investigations?

Mr. JONES. Without consulting them I could not answer that, but my opinion is that the miners—a large number of them—would look with suspicion on anything that the operators might do, although they are a unit, as far as I can understand, in favor of establishing this bureau. I was at the meeting and seconded Mr. Lewis's motion, so there was no division there about adopting a resolution to recommend to Congress the passage of a bill for the purpose of investigating these accidents.

Mr. CHANEY. Do you think it is highly important that some steps be taken to discover the causes of these terrible accidents?

Mr. JONES. I certainly do.

Mr. HOWELL. It has been suggested here that frequently the mine is rendered unsafe in a comparatively brief space of time by something that was unlooked for. You do not hope, do you, by any scientific investigation, to determine just when these conditions will arise in a mine?

Mr. JONES. In our experience I have never known that the mine would be rendered unsafe within a short time from an absolutely safe condition. In my own practical experience, I have heard tell of places—for instance, in Belgium—where they struck a big feeder of gas there, and the gas went up the shaft with such great force that it exploded in the air and burned for an hour or two in the air before it went back in the mines.

Mr. HOWELL. Such a condition as that is practically beyond human foresight?

Mr. JONES. Yes, sir.

Mr. HOWELL. If you have a big fall some place, in five minutes you have gas in places where you never had it before. That is the condition I am speaking of.

Mr. TAYLOR. That depends on the conditions in the district.

Mr. ENGLEBRIGHT. In connection with all these matters, Mr. Jones, there is a large territory of worked-out ground which necessarily becomes entirely inaccessible, and in which, necessarily, gases accumulate. Now, a big cave in some of this worked-out ground could throw a sudden gust of gas into the regular workings, could it not?

Mr. JONES. Under certain conditions it could; under the retreating system and the return-air system it could not; these falls generally give a great deal of warning before they come; that has been my experience.

Mr. CHANEY. Where is your mining field?

Mr. JONES. The Pittsburg district, Ohio, West Virginia, and Kentucky.

Mr. TAYLOR. Those falls, too, depend upon whether there are overlying strata of coal that allow gases to come in.

Mr. ENGLEBRIGHT. There is one phase of the subject I wanted to ask a question or two about, and that is this: In our hearing last Monday the question was discussed of what you call the waste in the coal mines, of a great amount of coal being left underground and more or less wasted in different ways, so that of the actual coal in the seam there is not over 60 per cent used. Have you any ideas on that subject?

Mr. JONES. That is true in some cases, but there are mines where they take out 90 per cent. If you are in a district, such as we call a ——— No. 8 district, where the coal is not worth a great deal per acre and the roof is very bad and dangerous, they take a section, say 33 feet for a room, and they drive up about 24 feet, from 21 to 24 feet, leaving the balance of it as a barrier column. I do not know of any cases where they have attempted to recover that. In addition to that they lose the entry stems in most cases. The reason of that is that the roof is very dangerous and the coal is very cheap.

Mr. CHANEY. This goes very much further than that. It was discussed here that in the coal that was actually mined there was lost by waste much more than that—that is, in the methods of mining.

Mr. JONES. You mean in shooting to pieces?

Mr. CHANEY. Yes.

Mr. JONES. They do not actually waste it, but they make it unmerchantable at the highest price. If they shoot it, or pay them on a mine-run basis, they shatter it to pieces. Last year in one of our mines, a very large mine, we had a little trouble with the miners about the screening of the coal, and we compromised for about sixty days by paying them on a mine-run basis. At the time we went on that basis we were getting 34 per cent of slack and 66 per cent of coal which would pass over an inch and a quarter screen. At the time we discontinued that basis we were getting something over 50 per cent of fine coal, I think 52 per cent, and the balance coal which would pass over an inch and a quarter screen. We have honest miners and some who are not, and they would shoot the coal to pieces and make it unmerchantable.

Mr. ENGLEBRIGHT. The question goes to the point of whether there are not large values in the way of coal lost in the methods of mining

at the present time that the country, years from now, would be very glad to have on hand.

Mr. JONES. That is true, but under the keen competitive conditions, unless you gentlemen show us some way to get a better price for our coal where it is so cheap in the hill, the price that would enable us to take it out in this district I refer to at a higher price, it would not be profitable to take it out. If Congress would only pass a bill minimizing the price at which we could sell coal, I think that would solve the problem.

Mr. HOWELL. I understand that in most of the disasters that occur the reason is understood; it is known why the disaster occurred.

Mr. JONES. You take 87 per cent of the accidents in the Pittsburg district, and we absolutely know why every one of them happened, and all the conditions and whose fault it is.

Mr. HOWELL. What per cent?

Mr. JONES. Eighty-seven during the last fourteen years. I just tabulated that yesterday. Seventy-five per cent of the accidents in the Pittsburg district were caused by falls of coal and slate and mine cars—trips.

Mr. HOWELL. There is absolutely no dispute about that?

Mr. JONES. Absolutely no question. I will say, and go on record, that 50 per cent of the accidents that occur in our district are simply due to the fact that the miners do not obey the present mining law.

Mr. FOSTER. But what you mean by that—that 87 per cent covers the need of these scientific investigations that might be made. That is not what you understand, is it?

Mr. JONES. I will qualify that answer. Sixty-one or 62 per cent of those happen from falls of coal and slate.

Mr. FOSTER. Now, really, so far as these explosions are concerned, and these disasters of that kind, they are not included in this per cent you speak of?

Mr. JONES. Twelve per cent of the accidents that occurred during the past fourteen years, not including last year, were due to the explosions of gas.

Mr. TRAER. Twelve per cent of the number of accidents or 12 per cent of the proportion of persons injured?

Mr. JONES. Sixty-one per cent falls of coal and slate, and 13 or 14 per cent from mine cars and motors and trips, and about 12 per cent from explosions of gas, and the balance of the explosions were due to a variety of causes, electricity and so forth. If we had this Bureau, they would show up the causes of all of these accidents. There are a great many people who get up blood-and-thunder talk and say the operator was to blame. The mine inspector himself came up and investigated from Harrisburg, and he made a report stating that 50 per cent of the accidents were due to lack of thought on the part of the employees.

Mr. HOWELL. What proportion of the disasters occur which baffle the skill and science both of the men and the operators, from causes they are utterly unable to account for?

Mr. JONES. In our district I would say about 10 per cent.

Mr. TRAER. Do you include nonfatal accidents?

Mr. JONES. No; I am including fatal accidents.

Mr. CHANEY. But the terrible accidents are included in that 10 per cent?

Mr. JONES. That does not include last year.

Mr. CHANEY. But you include in that 10 per cent the terrible accidents?

Mr. JONES. For the fourteen years; yes, sir.

Mr. FOSTER. Do you take the loss of life? That is, out of 100 men who lose their lives in the mines that there are 90 per cent of them you know the cause and 10 per cent you do not know?

Mr. JONES. Yes, sir.

Mr. SEIFERT. Are you speaking of the number of men?

Mr. JONES. I am speaking of the percentage of men; 10 men out of 100 we do not know, and that would be almost covered by the Hardwick explosion and the Johnstown explosion.

Mr. CHANEY. Let me suggest to you this: We had before us the ex-lieutenant-governor of West Virginia, who talked about the great explosion in which 350 lives were lost in a mine in which he himself was interested, but he says it was an absolute impossibility for them to determine how that accident occurred or the cause of it. Now, you know 350 men lost their lives in that one accident. Is it possible for you to be right in your statement now that only 10 men out of 100 are destroyed by those indeterminable causes?

Mr. JONES. I am absolutely correct in my statement for the fourteen years preceding 1907 in the bituminous district of Pennsylvania; I do not know anything outside. I am speaking of the bituminous district of Pennsylvania.

Mr. CHANEY. I think some of the companies are very much at fault, then.

Mr. JONES. No; his mine is in West Virginia, and in 1907. I say in 1907 these terrible accidents happened, and they are the accidents under discussion. The Hardwick explosion, which occurred a few years ago, is included in that 10 per cent, and so is the Johnstown, but if this percentage had kept as it has for the fourteen years, I do not think we would have had all this anxiety to try to find out what the causes were.

Mr. FOSTER. Now, another question. This 90 per cent of the loss of life in these mines is from causes which you know, I understand?

Mr. JONES. For fourteen years prior to 1907.

Mr. FOSTER. Are these accidents—this 90 per cent—of the kind which might be prevented if proper care were taken?

Mr. JONES. I feel confident that more than half of them could be prevented if the miners and operators, particularly the miners, carried out the mining law. If they examined their chambers in the morning when they went to work and saw that they were safe, these accidents would have been prevented. When I was a mine boss I walked into a young man's room—he was a schoolmate of mine—and I noticed he had a large cut of slate in his room which was just ready to drop. I said "Alec, you should take that slate down," and he kidded me a little while, because I was young and so was he. I insisted on it and he agreed to do so. I started down the entry toward double parting, and I had not been away from there an hour until the runner came running along and stating that a man was killed, and I asked who it was and he said it was Alec. He had tried to take a bushel of coal and the slate had fallen and killed him.

Mr. TRAEER. They are just like train operators, they take the chance. Familiarity breeds contempt. In Pennsylvania you have a mine

examiner who goes through the mine every night before the men go in in the morning, do you not?

Mr. JONES. We have six fire bosses in our mine who go around and visit each chamber in our gaseous mines and make a report in writing as to the conditions, mentioning any place where there might be any danger, and barring that place off in their trips.

Mr. TRAER. In Illinois we have an inspector who goes through our mines every night without regard to gas, mines where no gas was ever heard of; we have a man, or sufficient men, visit their working places in the mine and see that everything is safe, or if there is anything wrong he marks it, makes a note of it, and he must come out and make a report in detail in a book of every working place in the mine, showing those where there was danger, and stating if they were safe, and that book is open to the inspection of the men before they go in every morning. They see the report of the mine examiners. If there is any gas about a mine, we have a fire boss there and he must make his report in the same way, and yet men will go past the instructions of the mine managers not to go into the rooms when they have been reported unsafe, unless he follows and prevents them. I state that to show how impossible it is to prevent accidents, even when you know the cause, for the same reason that railroad switchmen and train operators everywhere will take chances and do things which cause their death and serious injury simply from the contempt which grows out of familiarity with their work. It never will be possible to prevent those accidents.

Mr. JONES. If we go to work at 6 o'clock, these fire bosses start to work at 3 o'clock in order to see that everything is safe. I have never known gas to accumulate in three hours after they have made the examination. We give them sufficient men; in a very large mine we have six fire bosses and in smaller mines they have them in proportion. We are improving every day, and if you gentlemen had this bureau of investigation and you showed up these causes and showed that it was actually the fault of the miner, through his carelessness, that he got hurt by a fall of slate or by jumping on a motor trip—and we have men who would jump on the hind end of a trip and fall off and get hurt, or perhaps jump on the front end of their motor, where he did not belong, and fall on the track, or get excited and jump off—if that was shown up by unbiased people I think that would prevent it.

Mr. TRAER. You say that 10 per cent of your accidents are from unknown causes, in round numbers?

Mr. JONES. In 1906 there were only, from explosions, a little over 2 per cent.

Mr. TRAER. How many lives was that?

Mr. JONES. I do not know.

Mr. TRAER. How many are killed in the mining industry in Pennsylvania in any year?

Mr. JONES. In 1907 there were 400 and some.

Mr. TRAER. For ten years was it higher?

Mr. JONES. Yes.

Mr. TRAER. Was it as many as 50 men a year killed from explosions?

Mr. JONES. I think probably in the fourteen years about 400, as near as I can tell.

Mr. FOSTER. Killed by explosions?

Mr. JONES. Yes.

Mr. TRAER. Forty men a year, then, are killed by those causes in Pennsylvania alone?

Mr. JONES. In Pennsylvania alone.

Mr. TRAER. In the western field only?

Mr. JONES. In all Pennsylvania.

Mr. TRAER. Forty men a year are killed by explosion accidents?

Mr. JONES. I will send you a record of that, Mr. Chairman.

Mr. HOWELL. In those explosive accidents to which you refer, the causes in most of them are well understood?

Mr. JONES. The causes of more than 80 per cent of them were understood up until 1907.

Mr. FOSTER. I would like to ask you another question. If the proper precautions were taken by the operators in making the men more safe and the proper precautions were taken by the miners, could this per cent of accidents, this 90 per cent, in your opinion, be reduced very materially?

Mr. JONES. More than cut in two.

Mr. FOSTER. Of course carelessness you can not help.

Mr. JONES. I mean you would have to cut out the carelessness to prevent it.

Mr. FOSTER. But a great many of these bad conditions might be remedied so as to reduce it to a minimum. Is that correct?

Mr. JONES. Yes, sir; by the miners examining their working places properly.

Mr. CHANEY. About how many miners, by the year, are engaged in your Pennsylvania bituminous field?

Mr. TRAER. Do I understand you to say that about 80 per cent of the explosive accidents were understood?

Mr. JONES. No; 80 per cent of all accidents.

Mr. TRAER. This gentleman (referring to Mr. Chaney) asked you in how many of the explosive accidents the causes were fully recognized and understood.

Mr. JONES. I thought he meant the whole number. I think about 20 per cent. Nearly all of these small, individual accidents are understood.

Mr. TAYLOR. I might say in those large accidents there is no absolute testimony. Everybody has been killed in them, practically. The causes can only be determined by induction.

STATEMENT OF MR. J. FRANK TILLEY, REPRESENTING THE PITTSBURG COAL OPERATORS.

Mr. TILLEY. I want to continue the replies that have been made to Mr. Chaney's question as to what he shall say on the floor of the House when questioned as to why Congress should pass a bill of this kind and not leave such work to the different corporations.

The first reply I would give to that question is that the people want it; first, the operators are unanimous in asking for the passage of such a bill. They have been joined by unanimity on the part of the employees for the passage of such a bill, and I take it that where employer and employee are in perfect harmony the general public can only join in the chorus, and when the general public wants any-

thing I have no doubt that Congress will only be too happy to give it to them.

The second reason why this bill should be passed is that this question of explosion, which is overshadowing everything else, is only incidental to the operations of this Bureau; that is one of its functions. It will have many other functions, one of which, I understand, will be to look after the waste of the mineral resources of the United States, not only of coal, but of all the other mineral resources. We have only recently awakened to the fact that the country has almost impoverished itself as to its timber supply, and now every force and influence of the Government is being brought into play to see what can be done, not to conserve what we have, for we have not much left, but to produce some more, which is evidenced by the Inland Waterways Commission, with its broad scope, which has met with the favor of everybody; of course, an administration feature. While we still have some fuel left, it would be wise, it seems to me, for Congress to pass some general legislation looking to the conserving of that fuel supply.

It is a fact that you gentlemen have probably noticed that six months or a year ago one of our enterprising Pennsylvania citizens announced to the world the fact that he was going to take the ash heap in your back yard and use about a ton of that and about 15 cents worth of some chemical and he was going to produce some fuel equivalent to about three tons of coal. It does not behoove any man to say that the thing can not be done, but if such things can be done they ought to be done by the General Government and for the good of all the people, with some kind of a regulation that if any very beneficial way should be devised of producing a new fuel or combining what we already have so as to secure a greater efficiency, this bureau of mines and mining should take out a patent in the name of the people of the United States, so that its beneficent operations might be general and applied to all the people. It is barely possible and quite reasonable that such a bureau might make a discovery which would be of inestimable value to the human race as a whole, but if some private individual makes that discovery he will at once patent it and we must pay tribute to his inventive genius until his patent expires.

The great individual corporations are expending thousands of dollars, as Mr. Jones remarked, and I have heard representatives of the Westinghouse interests at Pittsburg say that they expend \$25,000 a year—averaging it—on work simply of an investigating nature. A private corporation expending such amounts of money to secure some valuable results, the social order has not yet reached that angelic condition when that private corporation is going to give its competitor the record of its investigations and discoveries; whereas if these investigations and discoveries are made by the servants of all the people and for the good of all the people, they will at once be disseminated broadcast so that everyone can use them, and I think that is one very strong reason. To return to the condition of the social order, I do not say that any private corporation would conduct a selfish investigation, but suppose that after an investigation of some great accident had been made and there was rather a diversity of opinion as to what caused the accident, and there are a number of doors through which the verdict may be shoved, if one of those doors has "Liability" in very

large letters over it and there is equal chance of a man reconciling his conscience and pushing it through either of those doors, through which door will he push? Whereas the General Government would conduct a perfectly unbiased investigation and would reach an unbiased conclusion, no matter who might be hurt.

Mr. HOWELL. Does not your State, by some competent authority, make an inquiry into these disasters?

Mr. TILLEY. Yes; they do these things and they do them very thoroughly.

Mr. HOWELL. Would not the investigation of the State authorities be just as honest as an investigation on the part of the General Government?

Mr. TILLEY. It would; but, as was mentioned in the general discussion by Mr. Traer, the scope of the information which would be in the hands of the general bureau would be of a more complete nature and would be gathered from more different sources than in the case with a single State, so that the knowledge reached would be much superior to that reached by the State; it is a lack of knowledge.

Mr. KEEFER. The investigations made by the States as a result of these explosions have been wholly in the nature of personal examinations; there have been no chemical examinations made. There has not been a particle of information or light thrown upon the subject, and the inspectors of two of our States which had the largest explosions in the last few months are not themselves agreed as to the causes. They have not any more facilities with which to determine the primary causes than anyone else.

Mr. TRAER. Have they the scientific attainments to do it?

Mr. TILLEY. None whatever.

Mr. HOWELL. Do you hold that an investigation now could determine exactly the cause of the disaster?

Mr. TILLEY. I do not think that it could at this late day, but it could have been determined, in my judgment, at the time of the disaster.

Mr. TRAER. Not with our present knowledge on the subject.

Mr. KEEFER. I think it could with a bureau equipped to make the investigation.

Mr. TRAER. The study of that one might lead to the prevention of another.

Mr. HOWELL. Some gentleman, during the course of the hearing, said that he thought it was impossible to ascertain definitely the causes of one of these calamities for the reason that every person connected with it in any way was killed, and that it would be impossible, after the thing occurs, to determine just what the combination of circumstances was that brought it about.

Mr. KEEFER. If a thorough knowledge were had of the combinations of coal dust, and so forth, it might be well within the realm of probability that those conditions could be prevented combining again.

Mr. SEIFERT. I would like to suggest there that I think it would be a big advantage to have a corps of people engaged in this particular business, and when there is an explosion that corps of fellows starts for the place and goes right there and stays there until they get some information.

Mr. TILLEY. I want to continue my remarks. We well know that the men whom we may designate as geniuses in broad lines are not

discovered every day. There is only one Thomas A. Edison in his field, and there is only George Westinghouse in his field, and the personal equation in these subjects is a matter of the most vital importance. It all depends in some cases as to who investigates the accident. There may be a case of surgery, and 999 surgeons would declare it an impossibility, and yet they sent over to Germany and got Doctor Lorentz, the man who fixed the little Armour girl's limbs, who was the only man who could do that, and I claim the same thing will apply in these places.

We want to find a few men who have broad genius in this line; and if an accident happens in the Pennsylvania field, they can go there and get a fund of information and observe all the phenomena and get all the data they can concerning that. Then, if something takes place in the West Virginia field, the Pennsylvania inspectors are not going to be sent there in their official capacity, but the same corps of men will go there, and the same way wherever it may be throughout the country. Then, while you set the same facts before two different men, one of them will draw conclusions that will benefit the whole race. He will discover antitoxin or something else. The elements are there, but it takes that one particular genius to say there is the bacilli of this thing or that thing. Also, I think Mr. Traer said it is not entirely impossible to discover these things, because the field of human knowledge is ever widening, and that is just in line with my argument here. I think at some time we may come into almost perfect knowledge of every phenomenon of nature, and the movement in that direction has become markedly accelerated in the last ten or fifteen years since we have had geniuses arise in all these different fields, and that is what we need to bring about this matter.

Mr. FOSTER. Do you think that the establishment of the scientific mining schools in these different States where they would teach these different matters, educate the young men along these lines of scientific mining, would be a benefit?

Mr. TILLEY. I think they would be the greatest benefit, and if I were thrown out of this room for heresy, I want to defend the theorist; the practical man has been in the saddle, and they say, "Give us a practical man;" but I tell you what, it is the man who burns the midnight oil and says, "This thing must be true, and I will discover the cause of it," just as the great astronomer said, "There must be another planet there some place." A practical man would not have found it, but when the astronomer got the right kind of a telescope and made the right kind of an observation he found it.

Mr. FOSTER. The educating of these young men coming up in the scientific knowledge of mining, practical work, who might go out into these mines and take charge of them, would be a benefit.

Mr. TILLEY. You can make the question as broad as you please, and I will say, "Yes," unqualifiedly; we want the men who know the theories.

Mr. CHANEY. Is it not a fact that many of the accidents in mines are the result of ignorance on the part of those who caused them?

Mr. TILLEY. I feel fairly qualified to speak about the majority of the accidents—that is, where the fatalities are only one or two, because I have served the same company with Mr. Keefer in my present relation as claim agent, and it is fairly within the field of my observation.

I could give the men's names, if they were pronounceable, give you details and facts where one man is killed, which you can not get away from. The accidents are like this, for instance: A father and son were in a room and there was a piece of slate that was loose up in the roof, and there was just a little error in judgment as to where the post ought to go under it. He put it under where it was overbalanced, and it dropped, went down and killed the man. We have some 8,500 or 9,000 miners on the pay roll, and if you look over our records—a complete record is kept of every man who cracks his finger or is killed—the list almost invariably says, "Fall of slate."

I say it is not the fault of the operator in any of these accidents, hardly. The posts are there in the miner's room, and it is his business to put those up and protect himself, but he is in a hurry to finish the last car for the day, and he will take the risk and go under the unprotected roof. There is no one there to force him to stay away, so down comes some of the coal, or he gets up too close and he did not know it was loose, and it rolls over and kills him. Occasionally a man will start to go out an entry way which is a traveling way for men at an hour of the day he has no business to go. I will tell you a case where a man started out to go along the entry, and there are places cut in 18 inches or so deep, called manholes, for a man to step in when he sees a trip coming. This man was going through that entry way, but he did not stop in this manhole, but thought he had time to get through before the trip came, but he was too late, and he was caught and killed. I could go on, but it would be just repetition.

Mr. FOSTER. What training do the operators, these trained men, the men who own mines, those who have the practical management of the mine, get in their line of work?

Mr. TILLEY. In order that you might get the best and most authoritative answer on that, I will turn that over to Mr. Keefer, because he is the general manager of the mines and can give a better answer.

Mr. KEEFER. So far as the mine foreman himself is concerned, most of the leading coal-producing States require that he undergo an examination before a board, both in writing and oral, and he must qualify before this board as to his competency. In the State of Pennsylvania, for instance, one class of certificates, called first class, is given to those who are called competent to pass an examination for gaseous mining management, and another class for nongaseous mining management, and nowhere in the State of Pennsylvania—and this is usually true of most of the large coal-producing States—is the mine managed by other than those who have these certificates.

Mr. FOSTER. That is a State law which requires the men who manage these mines to have those certificates?

Mr. KEEFER. Yes, sir.

Mr. FOSTER. They are examined by a board of examiners?

Mr. KEEFER. Yes, sir.

Mr. FOSTER. Appointed by the governor, or elected?

Mr. KEEFER. Yes, sir.

Mr. FOSTER. What class of men constitutes this board, as a rule?

Mr. KEEFER. Usually one mining engineer and one or two coal operators and one or two miners.

Mr. FOSTER. Are they men who are educated in the line of scientific mining?

Mr. KEEFER. The engineer is supposed to be. The operator may or may not be, and the miner generally is not educated from the scientific standpoint. The oral questions are largely asked by the miners themselves.

Mr. FOSTER. Suppose a school of mines and mining were established in a State like Pennsylvania, where the coal interests are very great, would that be, in your judgment, an incentive to miners, men who are now doing the actual mining of the coal, to educate themselves in that line of work? For instance, there is an inducement that they may get on these boards. Is that a reward, or would it be a reward that they look forward to?

Mr. KEEFER. It would depend largely upon the difficulties they would have to undergo in order to go to the school. In Pennsylvania there are a great many schools of mining, and a considerable number of miners do study privately or at night schools, and work up to better positions. A very large number of mining engineers and superintendents in Pennsylvania are recruited from the miners in that process.

Mr. TRAER. There are also one or more of what are called "correspondence schools" where a man, without leaving his occupation, giving the time in his spare hours, may receive a very substantial training.

Mr. FOSTER. What I am getting at is that these schools might be established where they would be of practical benefit to men in that way.

Mr. TILLEY. You do not mean to confine it to coal mining alone?

Mr. FOSTER. Oh, no.

Mr. KEEFER. It is generally believed that the correspondence schools, particularly one of them, have done more than all the other schools.

Mr. FOSTER. But they do not come in contact with the practical part of an education of that kind. You might educate your miners and educate all the people connected with mining, if that would have a tendency to lessen these accidents you have spoken of here to-day. Ninety per cent is appalling to me, and it is said that amount is caused in the ways which have been mentioned here. If a proper education was made, it might lessen this, and you might find out the causes of these accidents that you speak of.

Mr. TILLEY. The average miner would not go to this school.

Mr. FOSTER. No; I guess not.

Mr. SEIFERT. His occupation is such that he would never educate himself for the business he is doing.

Mr. FOSTER. I want to illustrate the point like this, that in the State of Illinois a few years ago we had, at the agricultural college at Champaign, a room down in the cellar with old Professor Morrow, the teacher, and three students connected with the agricultural college. Now we have there in Illinois a great big school with 450 students who are learning practical agriculture. Now, whether such a condition as to mining, which, to my mind, is a great industry, and naturally has great danger connected with it, whether such a condition might be brought about so that in time, in ten years, you might educate and bring that matter up, as you have in the Agricultural Department, and find out these conditions from a scientific standpoint, is what I would like to know.

Mr. TRAER. I think it would be well to answer the question of the gentleman from Illinois further. A year ago this winter, when the legislature of Illinois was in regular session, the president of the University of Illinois, Doctor James, and the director of the Illinois Geological Survey, and perhaps some other gentlemen, endeavored to arouse sufficient interest to secure an appropriation for attaching to the University of Illinois just about what you have in mind.

Mr. FOSTER. It passed the lower house and was defeated in the senate, I am sorry to say.

Mr. TRAER. So am I; but it failed to succeed. Doubtless in time it will be passed; I believe it should, because the education of one man adds at least some leaven to the whole mass. But there are 70,000 mine laborers in Illinois, most of them underground. It has been said, and it is probably true of a large majority of them, that the question of the privilege of an education of that sort means nothing to them at all; they are men of such limited mentality and ambition that it means nothing to them at all. But I do believe, as you do, that every man who is willing to accept an education, to avail himself of that possibility, ought to have the opportunity, but that is a long shot.

Mr. FOSTER. Yes; but is not this a fact, that one great reason why they have not availed themselves of the opportunity is because the means of gaining that education has not been established yet?

Mr. SEIFERT. I do not think so, sir.

Mr. HOWELL. Is it not a fact that native-born Americans do not care to enter into the coal-mining industry, that you have to recruit your forces from abroad?

Mr. TRAER. The native-born Americans do enter into mining to a very considerable extent, but the demand for mine labor, the necessity for it, has been far beyond the supply of native-born Americans, and native Americans, as a rule, seek higher grades of employment of their own choice.

Mr. FOSTER. If these conditions were made better and men were educated more on that line, and that could be brought about, would you not remedy that condition a good deal?

Mr. TRAER. It would still remain common labor.

Mr. FOSTER. That is true, and the same condition, probably, exists upon the farm, and yet the fact is that the man who works upon the farm, if he gets an education, makes a better farm hand. You take it among the miners, I know, of Illinois, the section of country from which I come, we have a very intelligent lot of men, as a rule; some of them are very much so. I have come in contact with them. They are well informed upon various questions, and my idea was that if we might raise this condition and make it better, it would be a benefit not only to the men who work in the mines, but a benefit to the men who operate the mines. If you take intelligent labor anywhere and make it more intelligent, your are going to make the condition of the man who owns the plant better. I wanted to get the information of these men about it.

Mr. TILLEY. I want to give, as an additional reason for the fact, if it is a fact, that there has been an increase in mine accidents within the period of ten years mentioned, that in my opinion it is largely due to the influx of Latin races. I am informed that many mines that, say, ten or fifteen years ago were filled with miners of English

and Welsh and kindred extraction, are now almost wholly filled with men from the Latin races.

Mr. KEEFER. More Slavonic than Latin.

Mr. TRAER. I would like to make a brief statement in that connection of the investigation which took place in Illinois about fifteen months ago in connection with the disobedience on the part of the miners of the provisions of the powder law of the State, and what is called the "shot-firing law." The shot-firing law had been adopted with the end in view of decreasing the number of men injured or killed by the use or misuse of powder, and while the risk in considerable numbers has been lessened by the operation of that law, it very soon became apparent that the risk to the men who still remained in charge was multiplied and intensified by the disregard and disobedience of the law on the part of the men who prepared the shots for the shot firers to fire. Statistics were specially collected, not by the State but by the operators, to determine the number of accidents from powder within a certain period of time and how they occurred. They were classified into such heads as improperly placed shots, over-charged shots, men going back on missed shots, men caught by flying coal, not getting away from the shots soon enough, and perhaps some other classifications, one of which was the use of improper tamping, the use of materials for tamping which were forbidden by law, and one of the phases of the statistics was the nationality of the men who were injured by these causes, in most of the cases they being responsible for them themselves. To our great surprise the majority of the men who were injured in that way were English-speaking men; there was scarcely a Slav or an Italian among them; it was not what we expected to find at all, but it was what we did find.

Mr. TILLEY. It is just like opinions as to mine explosions. If you consult our records you will find that almost every name is unpronounceable.

Mr. SEIFERT. Do you have any that are pronounceable? The proportion is very light?

Mr. TILLEY. Yes.

Mr. SEIFERT. In Indiana, I think, we have 80 per cent of natives in our coal mines.

Mr. KEEFER. That is explained by the fact that Pennsylvania is so near the landing.

Mr. KOLSEM. I am very well satisfied that the large majority of the miners of Indiana are English-speaking people, most of them Americans, but we are having more foreigners now. I would like to say, however, for Indiana, that we are certainly in favor of this commission as outlined by our statement, as we believe there will be a great deal of good from it.

Mr. SEIFERT. I think it would be a crime not to get this thing through while you are at it, and save these horrible disasters.

Mr. TRAER. Mr. Chairman, after this discussion I would like to say further that I think it is brought out that no one plant could possibly eliminate disasters in coal mines any more than one plant could in any other industry or any other occupation in human life. It has also brought out the fact that a very large number of accidents could be prevented by methods other than the ones suggested in the shape of this bureau of mining technology. But it has not brought out anything that would show to the contrary in regard to the state-

ment that the safety of human life, especially in regard to accidents the causes and nature of which are most in dispute, would be very largely increased by the agency of such a bureau, and that it is the most immediate and certain method of reaching that class of accidents.

It is not believed to be to the exclusion of other methods which should be followed, but it appears that, even limiting the number of men killed in explosive accidents to 10 per cent of the number, that it still means that several hundred lives are lost in the United States every year on coal mining from explosive accidents, and if there were no other men killed in coal mining but from that cause I do not believe that Congress would hesitate a moment to take action to prevent the loss of those lives if they could be made to believe that action taken by Congress was the most feasible and would have the promptest effect and was probably the only practical method that can be looked to with any confidence to secure the dissemination of knowledge as to that class of accidents. If Congress should believe that it could save only 100 lives in a year, which would not otherwise be saved, I do not believe it would hesitate to take this action to do so. Perhaps it would do it for 10 lives, and perhaps for 1, if they felt sure that would save 1 life.

Mr. SEIFERT. Do you not think that the statement made by Mr. Jones here just now has not taken into account any but one big serious accident? If he would take the year 1907 his percentage would look entirely different.

Mr. TAYLOR. He has not taken that; he only includes the two accidents.

Mr. KEEFER. As he showed, there were some years when it was down to 2 per cent. I would like to bring up one point raised by Mr. Foster, which I expected Mr. Jones to answer, but which he did not, namely, as to whether or not the establishment of this proposed bureau would have any effect upon lessening the loss of life representing the so-called 90 per cent of fatalities. This Chaney bill, to which we are in a general way committed as being satisfactory, has this clause in it, "improvement of mine conditions."

The large individual cause for loss of life in mines is falls of slate and roof coal. The regulations of the various States are not identical in the tendencies to prevent this loss of life. In some States they have no tendency at all to prevent the loss of life from that particular cause. It occurs to me that a bureau such as proposed by this bill would go a very long ways toward reducing this mortality by recommendations which are not only specific but also general, recommendations which are made without any regard other than to the immediate safety of human life, recommendations as to practice by the workmen, as to discipline by the employer, and so on. I should think it would come thoroughly within the scope of this bill under that language "improvement of mine conditions." If we could save 5 per cent of the mortality due to these causes alone, it would be of immense benefit to the nation as a whole.

Mr. ENGLEBRIGHT. I do not think there is any doubt but a proper investigation of this subject by proper scientific men will ultimately lower the mortality rate and improve all the conditions of all the mines in a great many different ways and save life in all of the mines—all kinds of mines.

Mr. FOSTER. I think that is true. I want to say a word on a general proposition, that it occurs to me that with the vast interests this

country has with mines and mining we have been derelict in our duty. When we consider what there is in this whole country of ours invested in mines, and what may be discovered yet, we ought to give more attention to that subject than we are doing. Take the State of California, for instance, with its mines. What might be accomplished with the proper development of the mining of California no man knows. Take it in Illinois, Pennsylvania, or any other State that has mines, not only as a matter of dollars and cents, but what might be accomplished in the saving of human lives. It is of importance to the operators as much as it is to the men in the mines, because I do not believe there is an operator in this country who wants to see a man killed in the mines, and that whatever we do here we do with the idea of being fair to operator and miner alike, and it is only our duty, I think, to bring about, if we can, a better condition, and as one member of this committee I want to say to you and these operators that I am more than glad to have anything to do with any scheme that will accomplish this purpose.

I believe it ought to be done; we ought to do it in a spirit of fairness and a spirit of justice to all parties concerned, and I am very glad to have been in here and to have heard this examination. I have learned something by it, and I would like to see it continued further, and I hope it will be, until we do arrive at a proper solution of it, because, as I said before, the mining interests of this country are too large to be neglected. If you remember, in 1862 this Government gave to every Senator and Representative in Congress at that time 30,000 acres of land apiece to establish schools of agriculture. I am not complaining that that was not right; I think it was. I think the objects that have been attained in the establishment of agricultural schools have been of wonderful value. If we can establish a bureau of mines and mining and schools of mines and mining it will help along in this matter. I tell you, it is not only a saving of life, but it will help to develop the wonderful resources of our country, and I want to say that I hope this subcommittee will go right ahead with their work. [Applause.]

MR. TAYLOR. I would like to say one thing in connection with that. I do not believe that you, as Congressmen, need criticise yourselves for lack of interest in this matter, for the reason that those interested more than yourselves have been lax to a certain extent, but the condition of affairs in the mining industry itself has so changed in the last ten years that it behooves somebody of authority to take up these matters and handle them in an intelligent way. As to the question of any school taking this up and handling it, they can not do it; they have not the facilities to do it; they are not so located to do it. It must come from some person who has the authority, the ability, the facilities, and the money to do it, to carry it out in an intelligent way. Take the mines of Pennsylvania and West Virginia; up until within five or six years ago most of the mining that was done there in the bituminous regions was what we call "drift" mining.

Now, we are going down deep into the bowels of the earth and are encountering gas. The present time, it seems to me, is opportune, and probably it has been impressed upon us more because of this great loss of life than anything else. If these great disasters had not occurred, possibly we would have gone on for some years yet in this same rut. The knowledge of gas has been known to the scientific schools, when I was in them twenty years ago or more, and I

remember helping to make these very experiments on gas to determine where the greatest explosive points would occur, and all those things; but the questions of dust and other interesting experiments were not touched upon. If the authorities who pretend to know something about that are at great variance—and I have been reading a few of the English authorities, where they have been carrying on these experiments for forty or fifty years with scientific men who are still at variance in a great many instances—and every individual district in this country must have a separate analysis for its district to determine just what should apply in that district, you can not do that by or through any private corporation or arrangement, because that knowledge will not be disseminated largely enough to be of any practical value to those who are going into the mines and to all those who will be interested in every way.

I wish at this time just to say that I am also a delegate here, or representative, of the Mining Institute of America, an organization made up of operators, mine inspectors, mine superintendents, mining engineers, mine foremen, fire bosses. Miners can be members of it too, if they wish to, but there are very few of them members. We have two meetings a year, and the object of these meetings is to discuss all such questions as we have up here to-day, and various others that come up in the mining industry throughout Pennsylvania. They broadened the name a few years ago so as to include any person from any part of the United States who wanted to become a member, and also from Canada and other portions of America. We have had such discussions as these time after time. On the question of dust there are as many opinions, practically, as there are members of that institution. We are practically a unit as to the question of gases, but when it comes to handling the dust we are practically all at variance, and as to the matter of explosives likewise. But I might just say that the last time we were over here, a short time ago, I attended the convention of the West Virginia operators and they were telling their experiences along just such lines as this in regard to the explosives, just shortly after the Darr explosion and the Monongah disaster had occurred, and one man spoke of these so-called "safety powders" and the results that he had obtained in using them. He said that he was supposed to be using the flameless safety powder, and after they had exploded the shots in the room he took an open light and lit the gases produced and the room became a mass of flames. These are the things that this bureau ought to take up and analyze and disseminate the results broadcast among the mining industry. The question of what should constitute an explosive, what the effects of explosives should be after the explosion had taken place, the question of the kind of the dust occurring in each of the seams, the amount of dust that can be mixed with certain amounts of explosive gas in order to create an explosion, or where the safety point would be, we ought to know these things, and we ought to know a hundred and one other things that I can not mention. No one individual operator can make all the tests, and if he did make them he would not disseminate them broadcast.

I think the establishment of this bureau is so much in advance of anything that has been offered yet as a solution of these things that I feel like saying, on behalf of the institution which I represent as well as on behalf of the miners and operators—I have had some experience in all lines of mining work—that I would like to see this bill pass and put into effect. I am satisfied that we would

get a lot of information that would be valuable to us. Among other things I noticed a short time ago on the question of dust was that electrical machines are making so much dust that they ought to be thrown out and the watering of dust made compulsory, and so on. A few days ago there were some experiments made in the Westmoreland mine with reference to the various kinds of machines.

Mr. HUFF. I will say that we have that data and it will be printed. It should be here to-day for the use of the committee.

Mr. TILLEY. I just referred to it here to show that these matters that were laid down as absolute facts are shown up to be absurdities, so that a lot of stuff that is given as authentic or reliable information are not facts, and we do not know the exact facts, and they ought to be determined by some bureau or person who is not biased whatever, and that information will go out with such force that everybody will give it credence and obey it. Just a few days ago I was talking with the chemist of the Fairmont Coal Company, who had made a very interesting experiment before the coroner in connection with the disaster at Monongah. It was something like this: Some persons had been talking of watering this dust in the mines. He brought on the table before that committee a portion of this dust, put it in a pan, and attempted to water it, and he found that it was impossible to do it. I am sure that many of the men here who have gone through the mines have frequently stepped on what they thought was a solid body of dust and gone through to their shoe tops in water. There are a lot of experiments just along this line which ought to be made and the results of them given to the public, and this is the way to get at it in an intelligent way, and it seems to me that it will have more force than any other method of performing this duty. The experiment I refer to went further than that. To show that the dust was dry, he blew it. After he had wet it he took a spoon and stirred it up and blew it and could still blow the dust away.

Mr. FOSTER. It has been claimed that the wetting of the dust does not prevent explosions, and that that might account for it just in that way—that they think they have wet the dust where they have not done it—and in these mines, where they might have a dust explosion, where they have been attempting to wet the dust and keep it down, they simply have not done it at all.

Mr. TRAER. And the water which they have supplied simply furnishes that much more oxygen and hydrogen.

Mr. TAYLOR. The last report of the laboratory has shown some things which we had a suspicion of for some time, and I will simply mention one—they have not followed up the experiments—and that is the moisture which we have, which was supposed to be a very great detriment to coal, is proven not to be a detriment; in other words, that the hydrogen coming out of that moisture makes a hydrocarbon gas. There are a number of such experiments as these that ought to be made by an unbiased party and given to the world without any bias whatever.

Mr. TRAER. I wanted to say just a few words more about powder, the black blasting powder which is used in mining coal. There is a great deal of surmise and suspicion, especially in the minds of the miners, as to variations in the quality of that powder, which contributes to the accidents arising from the use of powder. There is no standardization of powder. The powder companies have supposedly standard chemical formulas by which the ingredients are mixed to make powder, the charcoal, sulphur, and the nitrate; but

the density of powder, its specific gravity, may be varied more or less by the amount of pressure to which the mixture is subjected before it is put in shape for making up into the grains of powder. There apparently is some variation in powders which is not fully understood, and not fully understood by the powder men themselves. There has been no study made, generally speaking, with reference to the direct connection between these variations in the manufacture of powder and the behavior of powder in blasting. Each powder company is engaged merely in selling its powder to the best possible advantage, but I do not mean at all to intimate that those powder companies engage willfully in any hurtful practices; on the contrary, I think they are simply in the dark themselves as to certain things.

Among other things it has been asserted that a powder in which potassium nitrate is used is a less desirable powder than one in which sodium nitrate is used. It is well known that there is not enough potassium nitrate in the world to supply the black blasting powder that is required. In Illinois alone we use more than one million kegs of black blasting powder, and in the States as a whole there are many millions of kegs used annually. If that subject could be studied itself at the same time unquestionably it would be productive of good. If the powder mills were subject to the inspection of this bureau of technology and their processes and methods were subject to the inspection and investigation and study of this bureau of technology, it could not be possible but that a great deal of good would grow out of the standardization of their practices, methods, formulas in manufacturing powder, in the mixture, in the pressure of it, and in the glazing of the grains of powder. One who is not familiar with it does not realize that a great deal of the powder that is used in blasting coal bears no resemblance at all to gunpowder. It rather bears a resemblance to coarse gravel, and a single piece of it may be held in the hand and lighted and thrown, and the variation in the speed with which it burns may cause mischief, and in the glazing of that powder, if it is imperfectly done so that it is more susceptible to the moisture. A powder which is rated under one classification by the absorption of moisture may, in actual performance, behave entirely different from what is expected of it.

I do not want to go into any further details, but merely bring out that one of the great causes of danger is in the unexpected things which happen in the use of the powder, and that the manufacture and preparation of powder is not fully understood, and in my opinion is not likely to be fully understood for a long time, if it is left simply to the evolution of methods in the competition of business; but that if the powder mills could be inspected and their methods investigated, and possibly a standardization of methods and practices brought about through this bureau, in that respect alone it would be worth all the cost of the bureau.

Mr. ENGLEBRIGHT. Permit me, on behalf of the committee, to thank you for coming here to-day and for the valuable information you have given us. I assure you this committee has this subject at heart and will try to report a bill that will receive the attention of Congress.

Mr. TRAER. Mr. Chairman, I desire to thank you for your courtesy and attention in listening to us.

(Thereupon, at 5 o'clock p. m., the committee adjourned until Monday, March 16, 1908, at 10.30 o'clock a. m.)

ESTABLISHMENT OF A BUREAU OF MINES.

COMMITTEE ON MINES AND MINING,
HOUSE OF REPRESENTATIVES,
Monday, March 23, 1908.

The committee met at 11 o'clock a. m. and was called to order by Hon. George F. Huff, chairman.

Members present: Messrs. Huff (chairman), Englebright, French, Beale, Hall, Pray, Bartlett, Foster, Nicholls, Hamilton, and Hammond.

The following persons invited to be present: Messrs. E. H. McCullough, president of Westmoreland Coal Company; Thomas Fisher, general manager of the Berwind-White Coal Mining Company; Benjamin M. Clark, of the Rochester and Pittsburg Coal Mining Company; Alexander Dempster, of the Pittsburg district of bituminous coal; H. F. Bovard, of the Keystone, Latrobe, Connellsville, and Greenwich Coal and Coke Company; F. R. Lyon, of the Somerset Coal Company; Thomas F. Walsh, of Washington, D. C.; Hon. George W. Dorsey, director of the American Mining Congress; James F. Callbreath, secretary American Mining Congress; Representative Chaney.

STATEMENT OF MR. E. H. McCULLOUGH, PRESIDENT OF THE WESTMORELAND COAL MINING COMPANY.

Mr. HUFF (chairman). Gentlemen of the committee, I desire to introduce to you Mr. E. H. McCullough, president of the Westmoreland Coal Mining Company. I am not flattering his company, I think, by saying that it is the largest producer of illuminating gas in America.

Mr. McCULLOUGH. Mr. Chairman and gentlemen, I am here to-day with several representatives of several of the large coal-mining operations in Pennsylvania to give you our views relative to the advisability of establishing a bureau of mining technology. I will only speak for myself in relation to this matter and let the other gentlemen present speak for themselves. I will say that on behalf of the companies I represent we are most heartily in favor of such a bureau; we think it will do an infinite amount of good, not only to the miners but to the operators, and I think the great advantage to be derived from a bureau of this kind will be that it will act as a sort of general clearing house of information all over the United States. Of course we have our own department of mines in Pennsylvania, but that confines itself to the very limited area of our own State. That is one State out of thirty. We feel that this bureau will bring all investigations together under one common head, and that its scope, we understand, will be to disseminate general information which it will collate from all the sources possible, and we can not but feel that the thing will do a great deal of good.

I have gone over the various bills, and, taken as a whole, I think the Chaney bill is the one that covers the ground more thoroughly than any other, but I think one trifling amendment should be attached to that, which we have taken from the Hackney bill. The Chaney bill simply states, on the second page, that the President is authorized to appoint a director of the bureau of mining technology, who shall receive a salary of \$6,000 per annum. We would suggest as an amendment, "shall appoint a director of the bureau of mining technology, who shall be a competent mining engineer of at least ten years' experience." We think that limits the appointment. As the thing stands it is perfectly open, but we feel that a skilled mining engineer should be at the head of the bureau. The bill further provides, of course, that he has power to appoint experts and other advisory counsel, so to speak, whom he may require. We also think that it should be understood that this bureau should work in harmony with the Geological Survey, which has done a great deal of good in its time and is admirably directed. This bureau of mining technology would provide a practical end to the scientific end of the Geological Survey which, as I understand their scope, is simply limited to surveys and geological reports and matters of that kind and has nothing to do with what might be termed the practical end of mining. I think in the hearings had before your committee Monday two weeks ago, and afterwards, the ground was so thoroughly covered at that time by a committee from Pittsburg that scarcely anything remains to be said, and unless you want to ask me some questions I will ask Mr. Clark, of the Rochester and Pittsburg Coal Mining Company, to make some remarks in the matter. I have never made a speech in my life, but Mr. Clark has had more experience than I have had and can give you our views more clearly than I can.

Mr. BEALE. I would like to ask whether, in your opinion, with the knowledge you have, your policy would be to connect those two bureaus?

Mr. McCULLOUGH. I did not say exactly to put the new bureau under the Geological Survey, but at least have it understood in some way that they should work in harmony, that the two should be regarded as parts of a machine which should work together, and therefore all the information, both as to the geological and the practical end, should be brought together in some way so that there would be no conflict between the two to begin with, and it would be a better vehicle of transmitting information than if we had both.

Mr. BEALE. That was my reason for asking this question, whether you had worked out any union ideas between the two bureaus as to how they could work together in the most uniform and most beneficial manner for all parties concerned. I thought possibly you might have had some information that would be of very much use to this committee, as to how they could work in union.

Mr. McCULLOUGH. I confess that I am not sufficiently familiar with the workings of the Geological Survey as a bureau to venture to suggest anything at all. I know that there are other gentlemen present who probably are very familiar with the subject and will give you their views later on.

Mr. ENGLEBRIGHT. Here is a question which has been asked several people before this committee: Which do you think would be of more benefit to the mines and mining industry and the miners, ex-

periments and investigations of a scientific nature by experts making tests concerning the explosive properties of dust, gas, and so forth, or by taking the statements of practical miners in the various mines as to what their theories are concerning the causes for these explosions? In other words, do you think the miners need assistance most of a scientific nature or of an industrial nature to be benefited?

Mr. McCULLOUGH. I will answer the first part of that by saying that I think the benefit to the miners and mine owners would be a question of mutuality. I think they both would be benefited by any investigation that could be made. So far as the practical question is concerned as to the safety of life and limb, I believe that since the time of the late explosions both practical and scientific men have seemed to be entirely at sea as to what caused them. There is talk of dust and other things, but I believe that you have to begin, in order to arrive at a satisfactory conclusion, at the scientific end and then apply the information given practically. That is the way we feel about it. We are doing everything we possibly can to protect our men, but I think that all sadly lack information as to what is really wanted to be done, and I believe this bureau would immediately start in that direction; I think probably that should be the first thing they took up, the question of mine explosions, and suggest remedies and give us some chance to know from the scientific end just what the cause is, and generally when you know what the cause is you can find the remedy.

Mr. HALL. To state the question in more concrete form, there are bills here at least one of which proposes to place this bureau under the Department of Commerce and Labor, and another one, or more, perhaps, proposes to place it in connection with the Department of the Interior—that is, ally it with the Geological Survey. Those who advocate placing it with the Department of Commerce and Labor do so upon the theory that the investigations required should be of an industrial or practical nature, and more in line with that Department's work. Those who believe that it should be allied with the Department of the Interior claim that the work should be more of a scientific or investigating nature. It will probably become necessary for this committee to decide which of these Departments this bureau shall be allied with. What, in your judgment, would be the best course to pursue in that regard?

Mr. McCULLOUGH. My judgment would be most emphatically in favor of the Department of the Interior, because I think that we know all we can know from a practical end, and we know very little on the scientific end upon the causes of these explosions. I do not think it comes at this time, at least, within the scope of the Department of Commerce and Labor. It is a condition which confronts us, and nobody seems to be able to show us the way out. There are several theories, and we know from the testimony given by Mr. Wilson and others that the wetting of dust, for instance, does not do any good at all. He showed you an experiment here, or at least he spoke of one, where he thoroughly saturated the dust in a bowl, and after stirring it up was still able to blow the dust away. I think that the scientific end is where we should begin, and the Department of the Interior is where it ought to begin.

Mr. ENGLEBRIGHT. There is just one proposition I wanted to ask you about, and that is this: There has been a great deal of discussion

and action taken during the last few years regarding the preservation of the national forests, so much so that we have a very important bureau in the Agricultural Department, and there has been a large amount of land reserved, made into forest reserves, to preserve the forests and the timber. Of course, coalfields are not like timber; they do not grow any more; all the coal that we have in the United States is what is in the ground and what can be taken out, so that there is an absolute limit to it. I have heard statements made that as much as from 40 to 50 per cent of the coal is wasted underground in the way of pillars, seams that are broken up and never reached, or absolutely wasted by not being obtained. Can you give us any light on that subject?

Mr. McCULLOUGH. I can only give you light in relation to our own particular region. We have in the Pittsburg bed what we might call the main coal, the middle coal, the upper bottom, and the lower bottom. We can not take out the lower bottom because it is too sulphurous; our competitors can not take it out, so we do not. Sulphurous coal is a very great drawback, and people do not want to buy it. The upper member of the vein is separated from the middle member by the slate parting, in some cases about a foot thick; above that I think there are 4 feet of coal. You could get the slate out after a fashion, but when you get up there the coal is so sulphurous it is not merchantable. So by force of circumstances we are only able to take out a little over two-thirds of the coal that is available. I mean, if anything is coal, of course it is coal, but when it comes down to a question of analysis, it is not a merchantable article except that which we take out. That is an unavoidable waste, but in the far future, when all the really high-class coals free from sulphur are exhausted, it is possible that the upper and lower member will be taken out, but just at the present time I do not think that anything can be done to remedy those conditions.

Mr. ENGLEBRIGHT. Would that not be a very pertinent subject of inquiry for a mining bureau to consider—the future supply of the coal of the United States, so far as methods might be devised for using or mining this coal to an advantage?

Mr. McCULLOUGH. I most certainly think so, and I know that would be welcomed by every coal owner in the country, and I understand from the Chaney bill that that is proposed to be a duty of the bureau.

Mr. ENGLEBRIGHT. If that could be done, would it not only involve millions of dollars, but billions of dollars, so far as the business interests of the United States will ultimately be concerned?

Mr. McCULLOUGH. I hardly think it would go up into the figures as large as that, because there are a great many parts of the country where they can take out all the coal, for instance, especially in the Pocahontas region, although that is supposed to be a part of the Pittsburg district. All that parting disappears, and the upper member takes the place of the middle member—that is, it is free from sulphur. But I am speaking only of the Pittsburg district, and I think millions of dollars could be saved if you can show us how to utilize that other member; it would be an enormous sum of money.

Mr. ENGLEBRIGHT. That is what I mean; it is certainly a thing the result of which you could not say offhand, but it is a very serious question and requires consideration.

Mr. McCULLOUGH. You take our own field, for instance, there, if you want to develop, say, a mine, you have to make your preliminary work. For instance, we recently developed a mine 330 feet deep. Under the laws of Pennsylvania you have to put down two shafts. The sinking of the shaft and the lining cost \$100 a foot, so it would cost you about \$66,000 for a mine that deep to sink that hole. Now, if through that hole in the ground we could take out 9 feet of coal instead of 5 feet, you can very readily see that a large surface you would have to spread that \$66,000 over, but of course that is not a drop in the bucket compared with the development of the mine. Of course the more that you can get out of the mine the more you are warranted in your expenditure.

STATEMENT OF MR. THOMAS FISHER, REPRESENTING THE BERWIND-WHITE COAL MINING COMPANY.

Mr. HUFF (chairman). Mr. Fisher, who will now address the committee, is the general manager of the Berwind-White Coal Mining Company.

Mr. FISHER. Mr. Chairman and gentlemen of the committee, we are busily engaged at the present time, both in Pennsylvania and West Virginia, where our operations are large, in securing adjusting laws for the governing, practically, of the mining industry. If we can secure some benefit from this movement, and secure such a bill as the Chaney bill, which suggests that we have an institute of technology, I fully believe that we will be largely benefited, not only the miner, but the operator as well, because the real effort we are all making is for the protection of human life. The inspection of the mines can be worked out practically, but the technical end, which involves the handling of gases, dust, etc., is a branch about which there is no question but what we could receive great assistance from a technical department, and we would welcome such an arrangement; we need knowledge, and we believe that it would be beneficial to every operator. We have had serious difficulties in Pennsylvania, and West Virginia as well, and while we are all struggling to correct what we know is there, the scientific determination of the handling of it would be of the greatest service to the mining department of every operating company. I do not know that there is anything more you could say, because we are all making this one effort for the protection of the employee. That loss, of course, can not be replaced. The damages to the various operations from explosions and otherwise are simply a money loss, which I do not think the operator looks upon seriously after the experiences we have had in the past year.

The CHAIRMAN. Your thought is that this bureau of mining technology would be a benefit to the miner?

Mr. FISHER. Absolutely. The technical knowledge that would be disseminated by an institute of that kind or a department of that kind would be absolutely invaluable to the mining business, I believe, to-day.

Mr. HAMMOND. As I understand, then, you think that the United States Government, taking this up and putting it in such shape as they would do, would be an advantage over and above the State knowledge which we have in the different mining industries in regard to coal, at least?

Mr. FISHER. We have nothing in the States with which I am familiar to make investigations of this kind; we are whipping the thing out on the lines of practical workings.

Mr. HAMMOND. Therefore you think that this organization, combining it into a United States organization, would be to the benefit of all concerned?

Mr. FISHER. Unquestionably.

Mr. ENGLEBRIGHT. Do you believe that a bureau of this kind would furnish information that would be useful to State legislatures in passing State laws regarding the mining industry of their respective States?

Mr. FISHER. I believe that they could furnish the information; whether the legislatures would act on it or not I am not prepared to say.

Mr. ENGLEBRIGHT. My question was whether it would be useful.

Mr. FISHER. It would be useful, no doubt; it could not help but be useful.

Mr. HAMMOND. Have you a bureau of this kind in the State of Pennsylvania now?

Mr. FISHER. We have not.

Mr. HALL. What has been your experience, after these serious accidents have occurred, so far as legislation was concerned? Has there been legislation attempting to remedy the evils that existed and to avoid those accidents?

Mr. FISHER. There has been a very large amount of legislation prepared, both in West Virginia and Pennsylvania, but very little of it is practicable.

Mr. HALL. That legislation, then, as I understand you, has been ineffective by reason of the fact that the legislative body did not really know the causes of these disasters?

Mr. FISHER. That is exactly it, and I think the legislature of West Virginia, which has lately adjourned, has avoided the passage of a lot of bills that were not practical, believing that the Government would assist them in arriving at and determining the causes of these accidents, where they have been very frequent.

Mr. HAMMOND. Has there been any general sentiment or any considerable sentiment in the neighborhood of these accidents that the companies operating the mines were in any way responsible for the loss of life and the damage that followed?

Mr. FISHER. None that I know of.

Mr. HAMMOND. It is generally understood that the causes could not have been guarded against with the knowledge which the operators at this time possess?

Mr. FISHER. The mines, of course, are subject to inspection, and from the inspectors' reports, with the exception of one accident, I believe that they have all said that they were guarding them as well as they knew how.

Mr. HALL. There is a common purpose, as I understand you, on the part of the miners and the operators themselves, to ascertain the causes of these disasters, and then to adopt suitable remedies for their correction, and you believe that this bureau is a proper instrument through which to operate?

Mr. FISHER. I certainly do; yes, sir.

Mr. NICHOLLS. Are you familiar with the report of the committee who investigated the disasters of West Virginia, who reported to the governor?

Mr. FISHER. I have read that report; yes, sir.

Mr. NICHOLLS. Am I right in my memory that the committee reported that there was no need of additional legislation, and that the trouble was that the operators did not obey the existing laws?

Mr. FISHER. No, I think not; I do not think that was the gist of the report. They believed that they would not be benefited by additional legislation hurried through the last session without due consideration being given it. There is no doubt about that report raising the question not only in regard to their own mining department, but also to some of the operations, but it was narrowed down to the belief that they would not gain anything by passing a lot of radical legislation without proper technical knowledge on the various subjects.

Mr. NICHOLLS. My memory is that the report said substantially that there was no need of additional legislation, that if the present laws were properly enforced and carried out that such accidents would not occur.

Mr. FISHER. That is my belief, that if the mining law of West Virginia were carried out and they had competent men in charge of the inspection in that State they no doubt would get great deal better results, but in the estimation of most of the large corporations operating coal to-day they do not pay sufficient to get good men as inspectors to do the work.

Mr. HAMMOND. Have you inspectors who have no further duties to perform than to see that the operators are obeying the laws?

Mr. FISHER. That is their duty, that is what they are sworn to do, to interpret the mining law, and they are the men in charge.

Mr. HAMMOND. Any lack of efficiency on the part of the inspectors themselves would not excuse the mine operators, would it?

Mr. FISHER. No; it would not excuse them legally, perhaps, but if a man can show that he was carrying out the law, he would be legally exempt from charges, I should imagine, but if the mine inspectors are not competent the inspections of the mines are not all they should be, and there is no evidence on the part of the State that the operator has not carried out the law unless the mine inspectors find it so.

Mr. HAMMOND. But the operators have the ability to carry out these laws even though there is no inspection at all.

Mr. FISHER. No; the mine foreman is a miner, usually, a man up from the ranks, who looks to the mine inspectors to interpret that law for the practical operation underground, as well as from the superintendent's instruction.

Mr. HAMMOND. Is there not any man connected with these large mining corporations competent to interpret the mining laws and able to tell whether those laws are being carried out?

Mr. FISHER. He does, and he instructs every man under him to do it, but the seeing that it is done is on the part of the State.

Mr. HAMMOND. Is it not the understanding in the State that these mining companies can rely upon inspectors to see that the mining laws are carried out?

Mr. FISHER. No, they instruct their own men to carry out the law; they look to the State inspectors to see that they do, but in a question of difference they call other mine inspectors from other districts and they determine it as to practice.

Mr. HAMMOND. His duty is to detect violations of the law?

Mr. FISHER. That is what he is there for.

Mr. HAMMOND. But his failure to detect those violations does not either morally or legally relieve the mining operator from violating the law?

Mr. FISHER. Certainly not; but the operator, of course, has to show that he has not violated it, but he is liable, naturally.

Mr. HAMMOND. And should be?

Mr. FISHER. Should be.

Mr. HALL. Do you know of any State law now in existence that, if it were literally performed, would have prevented any of these recent disasters that have occurred?

Mr. FISHER. No, I do not.

Mr. HALL. Why?

Mr. FISHER. I do not know of my own personal knowledge the cause of those disasters.

Mr. HALL. Then it is because of the fact that the laws have not been so framed as to avoid the apparent cause of these disasters; is that the idea?

Mr. FISHER. The laws, I believe, are framed all right; the question of the knowledge of the conditions as the mines grow older is one that the law can be very much improved upon by investigation.

Mr. HALL. Is there not considerable variance in the different mines as to the causes of these accidents?

Mr. FISHER. There is no question about conditions varying.

Mr. HALL. It is difficult to have any general law applicable to all these varying conditions.

Mr. FISHER. Certainly. In Pennsylvania, you see, we are divided there into two distinct laws operating in the eastern and the western portions of the State; we have a law for each section.

Mr. CHANEY. One for anthracite and one for bituminous?

Mr. FISHER. Yes, sir.

Mr. CHANEY. Is not this report of the West Virginia disaster printed and available for the use of the Members of Congress who desire to get one?

Mr. FISHER. I think so. I have only read it in the newspapers, the official report, but I believe that it is published. I think they authorized its publication and distribution.

Mr. CHANEY. The question put by Mr. Nicholls leads us to believe that we ought to have that report.

Mr. FISHER. I think that they authorized it. I only saw it in the various newspapers at Charleston while the legislature was in session.

Mr. CHANEY. The report, I suppose, is a report made by the inspector to the State under his duty as inspector?

Mr. FISHER. No, sir; it is not; it is a report made by the members of the legislature who were appointed to ascertain, as far as they could, the causes of these explosions and report to the governor.

Mr. CHANEY. I take it that that certainly is printed, then.

Mr. FISHER. Yes, sir; it was printed, I think.

Mr. BEALE. Do you or do you not know whether the strict enforcement of the laws in Pennsylvania and West Virginia has frequently caused controversies between the miners' association and the mine owners—the strict enforcement of the law as it really stands?

Mr. FISHER. I do not know that it has; no.

**STATEMENT OF MR. BENJAMIN M. CLARK, REPRESENTING THE
ROCHESTER AND PITTSBURG COAL MINING COMPANY.**

Mr. HUFF (chairman). Mr. Clark will now address the committee. I understand he is connected with the Rochester and Pittsburg Coal Mining Company and the Jefferson and Clearfield Coal Mining Company.

Mr. CLARK. Mr. Chairman, as stated, I am connected with the Rochester and Pittsburg Coal Mining Company and the Jefferson and Clearfield Coal Mining Company and affiliated interests that appear in Clearfield County, Jefferson County, Indiana County, and Westmoreland County in western Pennsylvania.

I have had no opportunity to look over these various bills until en route here last night. I should agree with my friend, Mr. McCullough, on the Chaney bill as apparently the most desirable of those before the committee. There is no question but what a bureau of this character would render a very much needed service both to the operator and to the miner. The difficulty with the laws of Pennsylvania is this, that they have always been built up from the practical end, as to the better method of opening up the mines, as to producing coal, better ways of undercutting and blasting, all with the idea of producing and getting out coal. We are up against a proposition now almost everywhere in the coal interests of accidents happening from causes that we have been absolutely unable to figure out up to this time. All of these investigations result without any facts—scientific facts—to give any person light as to what was the cause. You will have a dozen different theories suggested by a dozen different people, but we have no person who appears to be competent from any scientific investigation to say to the coal industry in this country that, "you should conduct your line of business in this way or that way to protect human life and to protect your own interests," as it is to the interest of all operators to protect human life as far as possible.

You take our Pennsylvania law, we have State inspectors. In the first place the law compels the operator to have a mine foreman who is a man who undergoes an examination conducted by the State. That mine foreman has another party higher in authority known as the State inspector, who is likewise examined under the State regulations. The operator is supposed to interpret that law for himself, and the mine foreman is supposed to interpret it for himself. In the case of a difference of opinion the State inspector comes in, and he makes so many examinations of every mine each year. If there is still a difference of opinion there is an appeal to the court allowed, so that they can finally get the question definitely settled as to what they are compelled to do in the end. But the difficulty with the whole proposition is that it is all from a working standpoint, from the practical end of it, and what we need light on and need aid in is something in the scientific line that can tell us. If we are working in a mine which is unusually dusty we want some means of knowing

what percentage of dust mixed in with the air will make it dangerous and what we are required to do when that percentage of dust is determined; what percentage of gas is present and under what conditions it becomes dangerous, and what we should do to avoid that condition. To-day we are absolutely in the dark simply because there has been no special research along that line, and if I understand this Chaney bill correctly, that is the intent of it, and it is something which the Federal Government can well afford to do, to give aid to the mining interests of this United States. It is something we need; it is something that we insist on and plead for, to enable us all to reach that point, to overcome that difficulty. We are not up against any practical working problems; we have figured those out ourselves from the men who do the work; they have got their experience in the working problems. You take our State inspectors who are very good in their line; they know absolutely no more about the gas and dust problems than some person, probably, who never encountered them. You have a mine here which works along for years without any difficulty, and you have the same conditions, you are putting the same amount of air in there, and from some unknown condition, something which you can not detect without some scientific investigation or scientific knowledge, which we do not appear to have, we have a calamity, an accident.

Mr. CHANEY. Do you think that the operators, miners, and all others concerned would act upon technical information if it should be furnished by a bureau of the Government?

Mr. CLARK. I do not know any person who would be more anxious to follow any information they could get than the operators and the miners. These questions are serious questions for the operators, because it involves large litigation, extensive litigation; it involves to the miner the loss of time or the safety of his life. The operator is interested in that, and I would think that you would get great aid from both sources. We would be only too glad if we could have some information on that line to follow.

Mr. PRAY. From your recollection of the law applicable to the West Virginia and Pennsylvania situations, could you give us some idea of the qualifications which the law requires of the inspectors? What knowledge must they possess to hold the positions?

Mr. CLARK. That inspector is put through an examination that is conducted by a board appointed, I believe, by the governor of the State, a board of five. Those five men are selected from, I think, three miners and two mining engineers, and they are quizzed on the mining law, as to the proper entries, proper amount of air as required by law, and so forth.

Mr. PRAY. The inspector is a mining engineer, then?

Mr. CLARK. No.

Mr. PRAY. Not necessarily?

Mr. CLARK. Not necessarily at all.

Mr. PRAY. Then all he is required to possess is merely a practical knowledge?

Mr. CLARK. A practical knowledge.

Mr. PRAY. He may have been some former foreman of a mine, for instance?

Mr. CLARK. That is what he generally comes from.

Mr. PRAY. He has no scientific knowledge, then?

Mr. CLARK. None whatever.

Mr. PRAY. As to the causes of explosions?

Mr. CLARK. I know of none who have. We have problems arise and we appeal to them, but we find them as helpless as we are ourselves.

Mr. PRAY. Then the foreman has no greater practical knowledge than the inspector himself?

Mr. CLARK. Only from the practical standpoint—from the scientific he has none.

Mr. FOSTER. I want to inquire if these inspectors prescribe any particular way of mining coal in any particular mine, or is it a general idea?

Mr. CLARK. They counsel according to the conditions of the mine, as a rule; they do not lay down a general rule.

Mr. FOSTER. Each mine, now, is treated separately, or are all treated as a whole in the inspection and management?

Mr. CLARK. They are treated separately.

Mr. FOSTER. Under the State law, do these inspectors have the power to prescribe the kind of machinery that shall be used in each mine?

Mr. CLARK. No; but they can prescribe certain regulations in the use of it.

Mr. FOSTER. But the operator is left practically free to use what he wants to, is that it?

Mr. CLARK. Practically free to use what he wants to, unless it is something which has been demonstrated to be generally a dangerous proposition, and the inspectors generally object to the use of it. But, as a matter of policy, it is generally fought to a conclusion. People have different opinions on it, and if it is finally determined that it is a dangerous proposition, the operator gives way to it.

Mr. FOSTER. But I understand from your remarks, now, that they take up the whole mining subject in one whole, and treat the mining industry, the practical part of the mining, from that standpoint, more than they do from picking out one mine here that should be looked after in a certain way, and another mine in another way; that is, in regard to machinery, and all that?

Mr. CLARK. They do not pay so much attention to the machinery as they do to the inside conditions of the mine. The act of the assembly prescribes as to how you shall conduct your work inside, and they simply enforce or report any violations. They have power to bring criminal actions both against the miners and operators for violations.

Mr. FOSTER. Then the chief object of these mine inspections is to see that the general State law is carried out, not with reference to any particular mine, but the whole number of mines?

Mr. CLARK. That is the chief object. They are not empowered to do anything except what that law provides, and the law covers the practical end of it entirely.

Mr. FOSTER. What I meant is, the State law does not give them the power to go into any particular mine and prescribe the way that shall be conducted, does it?

Mr. CLARK. Only such as is prescribed by the act of the assembly. Of course, the operator is always ready to listen to an inspector.

Mr. FOSTER. Is it a fact that each mine has to be conducted differently from every other mine? Is that not possible?

Mr. CLARK. It might be possible, but it is hardly probable. We have regions, you know, for instance, you take our region; we call it the Punxsutawney region. The conditions there are practically uniform all the way through. When you get off into Westmoreland County, I presume you have conditions there which do not apply to the Punxsutawney region, but an inspector would probably lay down the same general rule for all the mines in the Punxsutawney region, because the conditions are substantially the same.

Mr. FOSTER. And yet is it a fact that the mining in that region is always the same? Is there a variance in the mining in that particular region?

Mr. CLARK. Not a substantial variance.

Mr. FOSTER. The rules that apply to one would apply to all?

Mr. CLARK. I think so; there may be an exceptional occasion.

Mr. ENGLEBRIGHT. You spoke about laws affecting machinery. The laws do prescribe various restrictions about the use of electric machinery underground?

Mr. CLARK. The law provides that electric machinery shall not be used in mines producing gas in dangerous quantities. There is where we get up against the scientific end. Who can determine where that dangerous point is?

Mr. ENGLEBRIGHT. The laws also make restrictions about the use of lights?

Mr. CLARK. Yes; after the gas is discovered in dangerous quantities, then it prescribes that it shall be worked with a safety lamp.

Mr. ENGLEBRIGHT. Then that question of gas in dangerous quantities simply resolves itself into what you might call the personal factor of the man making the inspection, as to his judgment as to whether there is gas there or not.

Mr. CLARK. It depends a great deal upon that.

Mr. NICHOLLS. You have your mine examiners who go around for the company, do you not, every morning, and look for gas, outside of the State inspector?

Mr. CLARK. Yes; outside of the State inspector, and outside of the mine foreman, in a mine which is producing gas in dangerous quantities, they have what they call "fire bosses."

Mr. FRENCH. What basis did you use for determining when gas in dangerous quantities is produced in the mine?

Mr. CLARK. He uses a lamp to test that; he uses a safety lamp to test it—simply knows there is gas there from the way the flame is drawn.

Mr. FRENCH. How often are those tests made?

Mr. CLARK. They are supposed to be made every day in mines that are known to produce gas, but the place we are in the dark is the condition which brings it about, and when it does exist, whether any general proposition can be laid down to give warning or protect or reduce that condition. We lack the scientific knowledge to combat it.

Mr. HALL. In other words, you know what the symptoms are, but you are unable to diagnose the disease or know what the principal remedies are?

Mr. CLARK. That is it.

Mr. ENGLEBRIGHT. Do you rely entirely on the judgment of a competent miner to know whether there is dangerous gas in the mine or not?

Mr. CLARK. Entirely.

Mr. ENGLEBRIGHT. You have no method of your own that you could look at the little dial face stuck up in your office telling you that there is gas accumulating in a certain part of the mine?

Mr. CLARK. No; and we have no method in the mine whereby our mine superintendent, who is supposed to be an expert, could go in in his general oversight and get some indication of it, nor has the miner any place to look. That is what I had in mind when I spoke of this scientific investigation, that it ought to result in some way so that it can be ascertained as a definite fact that when that is being produced there ought to be some barometer arrangement that would show when it reaches a dangerous point.

Mr. ENGLEBRIGHT. A mine manager ordinarily would risk the judgment of a competent miner on this question of gas sooner than he would his own judgment?

Mr. CLARK. Yes, sir; there is no question about that.

Mr. ENGLEBRIGHT. Because he has absolutely nothing on which to base his judgment except what you would call the personal, practical experience?

Mr. CLARK. That is all.

Mr. BEALE. In other words, Mr. Clark, as I understand, from your practical knowledge of mining and everything of that kind, there is no risk, with a scientific examination or arrangement by which there could be some indicator placed in your office or the office of any miner before the mine inspector went in in the morning to indicate as to whether there was or was not gas, or something of that kind, provided there had been enough money expended to show, without the miner going in there. As we understand, to-day the miner or some unpractical man, some unscientific man, makes the test with his lamp by some process which is altogether different from what science will show to-day. On the other hand, in addition to that, the miners go in there, and if they obey the orders which they have received there is no danger. Those miners go in there and they possibly do what they have been told to, and possibly they do not. Then an explosion occurs, for want of such practical knowledge as this bureau, as I understand from you, Mr. Clark, could and would be able to ascertain for the saving of lives, and so forth. On the other hand, have you not had trouble in your mines, and has not everybody else had trouble in the mines, by miners going in there and doing just exactly what they were told not to do?

Mr. CLARK. Yes, sir.

Mr. BEALE. And then here, if there is any trouble about it, if you stop those miners or arrest them, or anything of that kind, for having done that, the association which governs those miners goes on strike?

Mr. CLARK. The jury frequently acquits.

Mr. BEALE. I know; but your mines shut down.

Mr. NICHOLLS. I would like to know whether the answer to the question that those things are so, and that the miners cause explo-

sions by disobeying orders, does not interfere with your argument that the operators do not know what causes those explosions?

Mr. CLARK. No; I think not, because it is the scientific investigation we want. After we have discovered, ourselves, that the gas is there, of course the law requires that we put up certain danger signals and forbid any person entering that mine. Of course some person comes along and willfully violates the law and takes the chance and there is an explosion; we know who set off that gas, so far as carrying the light in is concerned, but we do not know what produced that condition or how it can be avoided, or when it reaches the dangerous point.

Mr. NICHOLLS. Is it not so that the mining laws of Pennsylvania command the operator not to allow standing gas in his mine?

Mr. CLARK. In dangerous quantities.

Mr. NICHOLLS. Of course.

Mr. CLARK. There is the question: Where is the danger point?

Mr. NICHOLLS. Is it not easy to detect the dangerous quantity of gas? Will not the average safety lamp placed cautiously in the mixture near the top of the roof show when it is explosive? Will it not explode in a minute?

Mr. CLARK. It will. We have explosions that take place, you understand, after examination has been made. A man who makes the examination can not be every place in the mine at the same minute; some of these mines are 5 or 6 miles underground.

Mr. NICHOLLS. I understand; but he makes a tour every morning?

Mr. CLARK. He makes a tour every morning.

Mr. NICHOLLS. And he enters the condition in a book, and when the miner goes to work he informs him whether or not the place is in proper condition, and if it is not, he is not supposed to allow the miner to enter the mine. Is that not the law?

Mr. CLARK. That is correct. You understand that particular portion of the mine only is in that dangerous condition.

Mr. NICHOLLS. In such a case the man should not be permitted to enter.

Mr. CLARK. In certain headings; they do not close the mine up entirely.

Mr. BEALE. Have you information as to how long it takes these dangerous gases to accumulate in any mine?

Mr. CLARK. Not a particle.

Mr. NICHOLLS. That is a matter of practice. Is it not true that a plentiful supply of air will always render a place free and safe from gas?

Mr. CLARK. Our laws on that line are, of course, presumed to be from the practical end of it, and the law prescribes how many cubic feet of air we shall put in there per minute per man, etc. You understand, on the fan they have regulators there which indicate every minute of the day just how much air that fan is throwing into that mine. If that fan is doing its work right up to the requirement of the law, you will still have accidents resulting from explosions. Some say it is dust, some say it is gas.

Mr. NICHOLLS. Yes. We are speaking of gas now. The reason I asked those questions is for fear the committee might be misled as to those accidents being always avoidable, known in advance, the existence of dangerous conditions, and the the miner himself practically commits suicide. That is why I asked those questions. Is it not

true that while there may be an adequate supply of air going into the intake of the mine in one or more departments there may be no air on account of the air box——

Mr. CLARK. Some disarrangement.

Mr. NICHOLLS. Yes; the air box being broken into and making a short circuit. Is not that possible, and does it not really occur as a matter of practice?

Mr. CLARK. It does, but suppose that your scientific investigation could arrange some kind of a barometer so that the minute you have a disarrangement in your mine, which may occur anywhere, that it might be indicated, and you have some notice and you can give the warning and reach it quickly before an accident could happen?

Mr. NICHOLLS. I am heartily in favor of having a bureau of mines, but I do not want the committee to be misled as to the points I mentioned a while ago about the miners being the cause of their own deaths; even that would work as an argument against the proposition you favor.

Mr. CLARK. I do not wish to be misunderstood; I say that occasionally those things so happened.

Mr. NICHOLLS. But accidents may happen.

Mr. CLARK. I do not mean to charge it to the miners.

Mr. NICHOLLS. Your argument would be in the main that some of those large accidents may be due to causes, and are due to causes, sometimes, that are unknown?

Mr. CLARK. Yes, sir.

Mr. NICHOLLS. And you favor the establishment of this technical bureau to investigate scientifically and practically and determine those causes, so that proper information may be given to mine owners and also the mine workers, inspectors, and all connected with the mines?

Mr. CLARK. Yes, sir, every person connected with the business.

Mr. NICHOLLS. I do not want to be misunderstood; I favor the proposition.

Mr. CLARK. If I created the impression that I was blaming these things generally on the miners, I do not want to make that statement; but I meant that you occasionally have a careless miner, as you have careless men in every other business.

Mr. FOSTER. You said a minute ago that some of these mines were very large and as much as 5 miles under ground. In examining those mines where there is such a large space underneath there, is it the rule to have more than one of these fire bosses?

Mr. CLARK. Oh, yes.

Mr. FOSTER. In order to cover that all thoroughly?

Mr. CLARK. They are required to make the examination within a certain time before the men go in to work.

Mr. FOSTER. The law requires that?

Mr. CLARK. Whatever it takes to do that, you will have to comply with it.

Mr. NICHOLLS. It must be within three hours of the commencing of the work.

Mr. CLARK. Either two or three; my recollection is two.

Mr. NICHOLLS. It may be, and they also have a place to mark to show where each man is down there.

Mr. HALL. Do you think that it is within the range of possibility, or probability, that some automatic device could be invented that would give notice of the existence of these dangerous conditions in the various parts of the mines, to do away with the necessity of relying upon the fallibility of men making an investigation, as you have described—that is, fire bosses?

Mr. CLARK. It appears to me that it should be reached in some form, or that it is possible. For my part, it appears to me that the air in that mine must get into a certain condition before it can explode, and from a scientific standpoint, if it could be determined at what point it does become dangerous, there should be some barometer or something that would indicate when it reaches that point—when it is dangerous—and which may lead, as you say, to a lot of automatic arrangements that would be used in that line.

**STATEMENT OF MR. ALEXANDER DEMPSTER, REPRESENTING
THE PITTSBURG BITUMINOUS COAL DISTRICT.**

Mr. DEMPSTER. Mr. Chairman and gentlemen of the committee, I do not know how to approach the subject; it has been elaborately discussed before you, but it seems to me there is just one phase of it which has not received the attention that perhaps it should have. As I understand this, the opinion prevails throughout the United States, and it has gone from the centers of those accidents that have happened during the past year or more, and it has created the sympathy of all people in the United States toward the miners. The subject has come up in different phases: Why can not the mining industry or the coal industry be operated on such lines as to better protect the lives and the health of the miners? That seems to me to be the focus of all the effort that is to be exerted in the legislation or in the execution of the present laws. To that end the different States have enacted laws, with which I am not familiar, being little familiar with our own, but more familiar with it than with any others, and in order to accomplish that result, as has been intimated and fully explained by Mr. Clark, we start with the fire boss as the protector of the mine, then the mine boss, the superintendent, and the inspector. Coming up through these grades, the fire boss is usually, I might say, a practical miner, a miner who, by his intelligence, his application, and study has equipped himself under the law to occupy that position. The operators employ him, and he occupies a position as a State officer, and if there is anything wrong he has practical control of the mine so far as its operation is concerned when he sees danger. If he goes into a certain place and his lamp indicates that there is gas there in a dangerous quantity, he is the judge of that dangerous quantity, and with his lamp, which is the scale by which he judges, if he deems it of dangerous quantity, he cuts it off, and no person is permitted to go in there, and the operator is bound to always acquiesce in that conclusion. I am going over the line of a miner taking down the signs that have been put to fence it off. If a miner goes in there and the fire boss is over here and he is told that there is danger, and there is danger marked there, if he willfully transgresses and trespasses over that territory, the fire boss can not tell; he can not tell, and there have been many cases of that kind, I think.

The question comes up, What is a dangerous quantity of gas in the mine? If they know that, and if there are any means of preventing that and giving knowledge to the operator and the mine foreman, then to the fire boss, the superintendent, and the inspector, the result should be attained at once, because that would obviate many of the difficulties that have arisen, and it would give to the State officers whom I have named information which would give them knowledge of certain facts which they do not now have.

As to dust, there is a very important matter, because I believe, our good friend Holmes here to the contrary, perhaps, notwithstanding, that a great many of these accidents that have had their sources in an unknown part of the mine, an unknown source, are attributed to dust, because they can not find anything else to blame it on. I believe there are some conditions of that kind. What we want and what I have in my mind, what every intelligent man in the United States wants for the protection of the miner, for the safety of their lives and the promotion of their health and the advancement of the mining industry, is a source of information from which there will radiate the knowledge which will equip every man in connection with the mine, from the inspector down to the fire boss, with that knowledge, and then it will be the fault of the executive department if that is not carried out. I think that is an incontrovertible point. What is that danger point? Mr. Holmes, perhaps, will tell you one thing and perhaps another man will tell you another thing. There are experiments to be made, and those experiments should be made by an expert who is thoroughly reliable, who is thoroughly informed as to the chemistry and everything in connection with it, and then from that source will come information which will go, not to Pennsylvania, not to Ohio, not to West Virginia, but all over the United States, and the people should all know it. Every man who can read the newspapers will know it, and there will be no excuse then for ignorance on the part of anyone. There is a great deal of excuse now because of the ignorance of the miners, and there are a great many of them ignorant; they do not know anything at all about the danger in connection with it, and hence they break down the barriers that have been put up by the intelligent fire boss to prevent them from going into dangerous places.

Mr. NICHOLLS. Do you favor an examination of the bituminous miners, giving them certificates of competency before they are employed?

Mr. DEMPSTER. No, sir; for this reason—that if you do that you limit the operation of the coal-mining industry to such an extent that I think it will be impracticable and we could not meet the demands of consumption.

Mr. NICHOLLS. Suppose that those who are now miners should be given certificates of competency, as was the case when the anthracite law passed, and all newcomers should be examined, would you favor that?

Mr. DEMPSTER. I will ask this question in reply to that: Suppose, as we have had the dearth of miners—we have not had more than perhaps 50 or 60 per cent of the amount required to meet the demands of the consumers—if 10 per cent of labor would come in, would you eliminate them until you put them through the school of mining in order to employ them in the mines, or would you employ them and

put them under the instruction and direction of competent mine bosses and superintendents?

Mr. NICHOLLS. If it is through the ignorance of the miners, I would say that they should not be allowed in the mines except as day-wage men, and not working at the face as miners until they passed a satisfactory examination.

Mr. DEMPSTER. I know you anthracite people took that up several years ago, and you got it through the legislature of Pennsylvania, but that would not suit our district at all.

Mr. HAMMOND. You said a moment ago that the fire boss made this examination, tested the gas and air in the mine, and then if he found it all right allowed the miners to go to work, but that miners might go in there through ignorance or carelessness, when they should not go in, and cause an explosion. Is there any way by which this bureau of mines can disseminate knowledge that will prevent the individual miner from violating some rule or order?

Mr. DEMPSTER. No, sir.

Mr. HAMMOND. Then, since that violation on his part may be the cause of these terrible disasters, is not the suggestion that the gentleman has just made, that the individual miner must be tested and found to be qualified to work in a mine, of considerable importance?

Mr. DEMPSTER. If the labor was sufficient to answer the demands of the country, I would say yes; but inasmuch as the demands of the consumer are very much in excess—especially in our district, I can only speak for that—of what the production is I think we could not do it, but we would rather take them right in and even put them with an intelligent man and take them right in the mine. How are you going to educate them other than put them in the mine? Are you going to have a practical school for that purpose?

Mr. NICHOLLS. Let me ask if that would interfere with at least about 50 per cent of them, working as day laborers, until they got the education?

Mr. DEMPSTER. How would they learn the mining by day labor?

Mr. NICHOLLS. They would learn a great deal about the mines that would qualify them to know the conditions and the dangers as to gas and roof.

Mr. DEMPSTER. If they were in there as day laborers they would be in there under the same conditions, exposed to the same dangers, in gaseous mines, as they are in now.

Mr. HAMMOND. Have there not been a great many experiments made heretofore to determine when the gas or the dust in a mine is dangerous?

Mr. DEMPSTER. I do not know what the experiments with dust have shown, but ever since Humphry Davy invented the safety lamp, the matter of gas has received the attention of the intelligent men who have made scientific research to find out.

Mr. HAMMOND. It is not possible, is it, that this thought of a bureau of mines and of scientific experiments to determine the dangerous gases and dangerous dusts in mines, has all arisen since these last explosions? Has that not been thought of before?

Mr. DEMPSTER. Yes, sir; and the laws of Pennsylvania have been focusing at that point since 1893, that I know of.

Mr. HAMMOND. What reason have you for believing, in view of these experiments that have been made, and of the continuance of

these disasters and of this utter lack of knowledge which you describe on the part of the operators and all others as to the cause of explosions, that the institution of a bureau of mines here at Washington will flood the country with any extraordinary amount of knowledge on the subject?

Mr. DEMPSTER. Because I think that the knowledge has not all been obtained yet; I think that there is further development of knowledge as the years go by.

Mr. HAMMOND. Do you think it can be better obtained here at Washington than anywhere else?

Mr. DEMPSTER. No, but wherever there would be a laboratory and wherever intelligent men would go; if you had a bureau here, those people would take certain parts, different tests which would represent the whole field, so far as general conditions would be concerned, and they would make examinations and experiments, and from those experiments that knowledge would come of what was desirable to be done on the part of the operators.

Mr. HAMMOND. But from those experiments in the past that knowledge has not been valuable.

Mr. DEMPSTER. There have been no such experiments in the past that I know of. The experiments in the past have been of a practical application.

Mr. HALL. What has been the most fruitful cause of these disasters so far as your observation goes in cases where the miner has not heeded these signs that have been put up by the fire bosses? Was it on account of ignorance on their part or was it on account of their willful disobedience?

Mr. DEMPSTER. In some cases both, I think. I have not followed those different cases of explosion such as obtained in the Cheswick explosion on the north side of our river, and the Darr, and these others.

Mr. HALL. Could they not understand the signs which were put up?

Mr. DEMPSTER. They could. They were put up so plainly, at least I suppose so, I was not there to see them, but I suppose they were put up so plainly that any person would know they were a notice not to trespass.

Mr. HALL. They should be told what the meaning of those signs is, do you not think?

Mr. DEMPSTER. Yes, sir.

Mr. NICHOLLS. Can you inform us of any of those big explosions which have been caused by negligence or by criminal action on the part of the miners?

Mr. DEMPSTER. My dear sir, the coroner's inquests have been applied to for that, and they have given their decisions.

Mr. NICHOLLS. I asked you if you can name a case in any of the big explosions where the miner was the cause?

Mr. DEMPSTER. I am referring you to the coroner's inquests, who got the information as to the facts in the cases. I do not know the facts.

Mr. NICHOLLS. Then you would not say in any particular case that those big explosions occurred through the disobedience of miners?

Mr. DEMPSTER. That I do not know.

Mr. NICHOLLS. I thought that the record would show that

Mr. DEMPSTER. I do not know from personal knowledge.

Mr. BEALE. After one of those great explosions the parties who possibly have been negligent and have caused the explosion do not report to the coroner at all; as I understand, they are all gone?

Mr. DEMPSTER. No; he has reported to another place.

Mr. NICHOLLS. How could the claim be made unless it were proven to the coroner?

Mr. DEMPSTER. You might say it is a fact, but not proven. That is a kind of a Scotch verdict.

Mr. NICHOLLS. That is rather unfair to the fellow who is killed.

Mr. BEALE. You do know, from your mining experience, that the miners go in and shoot out the soft coal and everything of that kind, when they are not allowed to do so, after having been notified not to do that? Your experience will show, I presume, that they do go in and shoot out the soft coal where they are not allowed to do so.

Mr. DEMPSTER. So far as my personal knowledge is concerned I have not been in to see them; I think there are what are called these "blown out shots," where the shots have been put in beyond the undercutting to the line of least resistance, where the light tamping has been put.

Mr. FOSTER. It has been suggested here that the miners very often are at fault in not obeying instructions of the fire bosses, as I understand, and cause accidents, the miners themselves. Is it possible that sometimes these fire bosses do not do their duty, and that they leave dangerous places where miners might go in?

Mr. DEMPSTER. Men are fallible.

Mr. FOSTER. That is what I am getting at.

Mr. DEMPSTER. And as long as you are dependent upon fallible men, you are liable to accidents. If there can be any machine, any measure of the atmosphere, to show its constituent parts and to show when it is charged dangerously with gas, that would get rid of that, and that would be a very desirable end to attain. A question comes to you, gentlemen, as legislators of this great country, whether or not you shall use all the means at your command and all that science will produce and can produce, following the developments and the discoveries into nature, whether or not you shall take the subject of establishing a bureau so that the best knowledge and the most advanced information can be obtained relative to the conditions which exist in this industry. You go into the farming district and you provide for certain things, which is well. Why? Because every man who puts a bite of bread into his mouth is interested in the production of wheat or cereals at the least possible cost. Every consumer of coal, every manufacturer, every family who consumes one pound of coal, is interested in this, because every burden that is put on the production of coal or any other article, every dollar that you put on that, has to be paid by the consumer. Every man who goes in and invests his money expects a little margin, and if he does not, like some of our coal operators in western Pennsylvania, he goes to the wall; he has to give up. He must make a certain margin, and he is willing and ready and insistent and persistent, as you know, Mr. Chairman, in trying to get the prices down to the least possible margin of profit he can obtain. Then the consumer pays that, and every man who consumes a pound of coal in these United States is interested in the procuring of such knowledge as shall produce that coal at the least possible cost and expense in complying with the

conditions that are necessary in its mining, having in view the health and the lives of the miners. That is the question, as I look at it, and all these different steps of execution will follow in order.

If you have such a bureau here, and this is the source, or anywhere else in the country, not here in Washington, but under a bureau of intelligent men, as I said before, from that will radiate all the knowledge that is obtainable and can be obtained, which can then be acquired by every man interested, and do you not think that will produce results? Certainly. Public opinion is very strong and powerful, and we might say almighty, in this country, because whatever public opinion goes for it always accomplishes, and all we are here for, as I understand it, as legislators, is to legislate for the benefit of the home, and it is for this purpose that we come before you and plead with you to establish a bureau by which or from which we shall receive the best knowledge obtainable as to the preservation of lives and the promotion of health of the miners.

Coming back to the States, as has been intimated, we come up to the organization of the State, the head of which is a miner, I believe. These inspectors are men who have risen from the ranks of the miners, who by intelligence and perseverance have educated themselves at home and through the instrumentality of your Scranton School of Mines, Mr. Nicholls, to be able to pass these examinations, and some of them are very good. The operators have been severely criticised—this may not be pertinent, but it is correlative—they have been seriously charged with not desiring to do anything that would cost a dollar to save the lives of the miners and promote their health, in public prints and elsewhere. I want to say to you, gentlemen, that I know of a board of directors who are interested in one of the accidents, and when the chairman was talking his voice choked and with tremulous tones he talked over the matter with as much sympathy, gentlemen, as throbs in the heart of any man in the United States not interested directly in the lives of those who were killed, and I want to say to you that that is the condition of many of the operators in our district, and I think in all districts. I want to just deduct from that that the operators are willing to cooperate in the execution of such laws or in the carrying of them out as shall do just what the law asks to be done. If we have come back to that main point, the best information obtainable and which can be secured and given out by you, then we shall have accomplished a great thing both for the miners, the operators, and for the people of the United States.

Mr. NICHOLLS. Would you as an operator favor the construction of brattices from each crosscut to the face in order to carry the air from the face up the shaft?

Mr. DEMPSTER. I would, and give instructions that a brattice should be put in at all places where it is needed.

Mr. NICHOLLS. Is there any other way in which a proper quantity of air can be carried to the face in each place except by brattices when the crosscut is back, say, 20 feet or more?

Mr. DEMPSTER. Whenever an opening is made that will obstruct the duct for the air, whenever that is stopped and the air has to be kept in the channel where it has to reach its destination.

Mr. NICHOLLS. Are you aware that in a good many mines there is no brattice carried from the last crosscut to the face?

Mr. DEMPSTER. No; I am not aware of the operations under ground.

I would like to answer a question which has come up about the mining, as to the quantity of coal and its preservation. As Mr. McCullough stated, there is what we call the bottoms. We have the stratification in the Pittsburgh district of a workable seam of coal about 4 feet, and then about 8 inches of one bottom, and that is divided by slate, and then about from 10 to 12 inches of what we call the lower bottom, which is usually impregnated with sulphur, so that it has never been taken out. The coal that can be utilized is about one-fifth of the whole, or 20 per cent, that has been left in which should be taken out. It can be taken out, and operators would be glad to take it out if it were not that the consumers will not take it. You know that, Mr. Chairman. There was a case I know of in which the consumer would not take the bottom coal, and it got to the point where the coal was very scarce, and they were very glad to take that bottom coal. There was nothing the matter with it, but for many years they would not take it, but the coal is all lost under the débris—under the cob—so it is under the cob now and never can be reached; it is lost forever. There is also what we call the roof coal, and that, under some conditions, could be utilized, and the fuel power of the country could be increased to a considerable extent. I thank you, gentlemen.

STATEMENT OF MR. F. R. LYON, REPRESENTING THE SOMERSET COAL COMPANY.

Mr. LYON. I do not see that there is anything that I can say. I think the ground has been thoroughly covered, and all I want to say is to voice the sentiment of the gentlemen who spoke before me, that I am very heartily in favor of a movement of this kind to establish a bureau of mining technology, as we think a great deal of benefit will be derived from it.

STATEMENT OF MR. H. F. BOVARD.

Mr. BOVARD. I believe, Mr. Chairman and gentlemen, that there is nothing I could say; that the gentlemen before me have covered all the points. I heartily indorse the statements of the gentlemen in saying that we do need such a bureau; I think it would be of benefit to the miners and the people generally.

STATEMENT OF HON. THOMAS D. NICHOLLS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF PENNSYLVANIA.

Mr. NICHOLLS. Mr. Chairman, this is just a hearing collecting evidence in the case. I could go on and say some things that might be of interest, and I will do so for a few minutes.

I want to say regarding the cause of mine accidents, explosions, and all that, that at times they are accidents; they occur through either the lack of knowledge as to existing conditions or because of certain conditions arising at the time which bring about accidents. I myself worked in the mines since I was a boy up until the spring of 1900, and I have felt the heat of the gas over my back, and

have had it singe my hair while at work. At times a gathering of gas may be caused by a door left open at some distant point which short-circuits the air; that happens sometimes. At another time it may be a cave-in which obstructs the air; that would cause a gas explosion in a gas-producing mine. But where those large explosions occur which involve the whole mine, it seems to me there must be a very dangerous condition existing generally through the mine or a very large accumulation of gas in one place in that mine. That might be caused by neglect in visiting some old workings, and perhaps a sudden cave-in may dislodge a part of that body of gas and bring it in contact with somebody's light, and in that way blow up the whole mine. I have known cases where men who were even fire bosses and whose duty it was to see that the mine was safe have, through forgetfulness, burned themselves. In our own city of Scranton about a year and a half or two years ago there were three or four mine officials killed by an explosion of gas, and after an inquiry they came to the conclusion that one of them must have either had a naked light or opened the safety lamps they were carrying. I have heard of cases where fire bosses going around in the morning, forgetting themselves, have actually gone up to a place they were going to examine for gas with naked lights on their heads and burned themselves to death.

Such things as that I would say are accidents, because if a man forgets, that is an accident, and you can not say he could avoid it, because he can not remember; and as a matter of practice where there is a continually existing condition of affairs in the mines, from the standpoint of accumulating gas which is dangerous, which ought to be known to a practical miner and a practical superintendent, under our laws in Pennsylvania the miners should not be allowed to enter the mine when such condition exists.

I would say from my experience that while it is necessary, wise, and all that, to have a technical knowledge of mining and know the chemistry of coal and of gases and their combinations and their dangers, the temperatures at which they will explode, the mixtures of air and gas, and so forth, at the same time I do believe that a close attention to two or three main points will eliminate dangers from explosions by gas, or one point, really, and that is to have big air ways, plenty of air, and see that the air is carried into every opening where men are at work. We know that gas can not explode unless there is a certain quantity of it mixed with a minimum quantity of air; after that time it will explode. If that is true—and it is acknowledged by all mining men—then the main thing is to have plenty of air, and in order to have plenty of air all that is needed is to have plenty of air ways and have plenty of power in a fan to circulate the air. The chief of the mining bureau for 1907, Mr. Roderick, states that in mines where gas has not been known to exist the air current is neglected, and that men are working in places where there is not a sufficient quantity of air. I believe that a closer attention to that one thing, a more thorough ventilation of the mines and every place in the mine, would save a good many lives from explosions.

I have worked in the bituminous mine and worked out in the Indian Territory at a time when we had a dust explosion. I had been working in the top vein and on that day moved down to the vein below and took my tools there and looked around and got ready

for work the next day. As I came down on the entry, preparing to go home, I met a man who worked in the first chamber on that entry, and he was preparing powder for his shots. I went up with him and saw them, and his place was the next to the outlet. There was a break there right even with the top of his chamber; no place for standing gas at all. He tamped his shots and went home. The shot firers came down and fired off his shots and the result was an explosion that tore the mine inside out, killed the shot firer and the pump man, who was back in the tunnel at the foot of the slope. The farther that explosion spread the worse it got, and I noticed after going back that props which had been set securely and with the weight of the roof upon them were blown out; they were not struck with anything, but simply the force of the compressed air blew those solidly fastened props clean out, threw the cars out the entry door, and it came up the slope a roaring volcano. I am satisfied that that was a dust explosion. I am satisfied that the powder, in blowing out this shot, which did not damage the coal at all, but simply blew out like the shot from a cannon, came out in a fan shape and heated the dust until it gave off the gases it contained, and that was repeated and repeated all the way through the mine until it was discharged at the surface. In my opinion it is that condition, and things of a like nature, that it is proposed to have this bureau examine into and give scientific information on, and exact information as to the cause of those explosions. I know that our miners differ as to the causes of them, and in our journal we have various parties writing at times on that subject. Some say there is no such a thing as a dust explosion; others say there is. I believe, myself, that what we really need is a bureau to make a scientific examination of those things and to determine what are the actual facts in all those cases.

There have been some tests made over in Great Britain. I read a few years ago where they proved that dust was explosive. There was a hopper in which coal had been stored from time to time, and on a certain day one of the men was sent in there to sweep out this hopper. It was empty, except for the dust, and it being dark he took a light with him, hung a lamp on his cap, and went in there and commenced sweeping and blew the hopper up. That seemed, to those who investigated it, to prove that dust is explosive under certain conditions, and I am satisfied that when the shot is fired and the powder comes out a blazing flame, and with force enough to raise the dust, that it is found to liberate the gases just the same as gases are liberated in those gas-producing plants where coal is turned into illuminating gas by heating. But there is so much difference of opinion as to those things that it is really necessary that a central bureau should investigate and give scientific data to prove what the facts are. Then the miners and the operators and everybody else will be bound to accept it, and the public will feel generally that adequate laws must be passed in the various States to provide against the existence of those dangerous conditions.

Mr. HUFF (chairman). I thoroughly agree with Mr. Nicholls, and think that when it is discovered there is danger lurking in a mine, it should be the imperative duty of the mine foreman to see to it that no man crosses the danger line during the existence of that trouble.

STATEMENT OF MR. THOMAS F. WALSH, OF WASHINGTON, D. C.

Mr. WALSH. Mr. Chairman, I am here representing only myself. I come at the request of Mr. Callbreath.

I am in hearty accord with this proposition. I think it will fill a duty that has been long neglected by the United States Government. The few remarks which I shall make will be made from the standpoint of metalliferous mining, mining of gold, silver, lead, and the rarer minerals. It is perhaps a sad fact that in all the years of that industry the National Government of the United States has never held out one helping hand at any time, nor does it to-day. For instance, in that industry we are on the borderland of great discoveries in the finding and the uses of the rarer minerals. If a poor prospector who is trying to develop the lands of the United States for the benefit of the United States—I think all will agree that if there is any beneficent industry which reaches out into the very veins and arteries of the nation that gold and silver mining surely is—if a prospector, as I say, desires to ascertain whether or not the ores which he is handling contain any of the rarer minerals, there is no means by which he can ascertain that knowledge, surely not by sending it to any department of the United States Government, for they in turn, gentlemen, must send it over here to a merchant, to Tiffany in New York. That, it seems to me, is a neglect that ought to be remedied.

In the carrying out of research work in that particular field of investigation the United States Government is the proper medium without a doubt. The States have not, do not, and will not do it, because it is a little beyond the daily utilitarian affairs of life. The United States Government is the largest owner of mineral lands in the world. The amount of mineral lands that your Government and my Government have to develop is simply stupendous. Then the United States Government has better access to the opinions and the archives of foreign governments than any State has, and in assuming that position, gentlemen, the United States Government will in no sense be invading the States' rights; it will be acting the part of the parent, the helper, the servant, if you will, to the States.

The idea I have in my mind for that particular department which I am speaking of is to have our National Government give, in some measure, the same helping hand to it that it gives to-day to the agricultural interests of the country. Let me illustrate. If you want to find out what the cause of a disease is on a tree and why weeds are growing in a lake, you can apply to the Agricultural Department and you will get by return mail the fullest information available in everything relating to the agricultural interests of our country, and I believe that is a grand and a meritorious work. In the field of mining the conditions are the same; nature uses the same means in the deposition of her minerals and in forming those particular minerals, so that one central investigating plant in one of the fields of activity, say in my State, Colorado, would give out information obtained from actual results which would be applicable to every State that has minerals, to Georgia just as much as to Nevada, and I refer to the rarer minerals. It is difficult, gentlemen, to tell what the possibilities of the future are in that direction. We all have heard about the wonders of radium. Radium can not be found, and yet I am positive, and I believe, that the United States Government has got it, I

will not say in abundance, but in quantities that will make it a very valuable product. Then there are the other rarer minerals like tungsten and vanadium, all of which are needed all over the world, more in the outer world than they are in the States in which they are found, and as I said, we have no means, no authority, to help us on in the finding and developing of those rarer minerals.

I would not recommend a bureau of mining if it were to sit here in Washington and issue pamphlets. If you will pardon me the suggestion that I would make for a mining bureau, I should say it should be an active, doing one, one out on the firing line with their plant out there where they can get the minerals and go into the mines on the lands of the United States; where they can disseminate to the operators and the miners the information, show them how and where to bring forth those great developments and enrich the nation by their production. The same, I am sure, would apply to the investigations in the coal mines and the iron mines. I believe that they should be right on that line, in some one central point, in Pennsylvania, if you will, where they can come in daily contact with the men who are operating the mines and get from them all the information they have and assist them in solving the great questions that should be solved by this intended bureau.

I will not take up your time any further, Mr. Chairman, but from my experience and knowledge of the mineral countries of the West I am positive that no more beneficial work, no work of higher statesmanship, can be performed than extending the helping hand to that great industry. It is needed now more than ever before, because, as I have said, we have now a great wonder, a wonder we can not solve, and I do not know of any better way money can be applied than helping solve those great problems. The treatment of ores is crude even yet. We have millions of tons of low-grade ore that, through lack of scientific knowledge, we can not afford to treat and pay three or four dollars a day for men to treat it. It is possible that the bureau such as it is suggested to create will, through the ablest minds that can be employed, send down into the field of activity, and establish laboratories and plants to make those investigations which will result in finding cheaper methods for treating the vast tonnage of low-grade ores, and further may result in bringing to light undreamed of possibilities in the rarer minerals of our country. I thank you very much.

Mr. FOSTER. I would like to ask you just one question, Mr. Walsh. What do you think of the advisability or the benefit that might come from the establishment of schools of mines and mining in the different States by the National Government, carrying out the same idea as the Agricultural Department, where now we have agricultural schools in every State and Territory?

Mr. WALSH. I am inclined to think that a real concentration of effort in one single place would be worth more than establishing a number of schools. The work to be done is not of a kind that you turn over to a multiplicity of persons. In other words, I would rather have 12 men with the proper laboratory in one establishment of the right kind than 5,000 scattered around everywhere.

Mr. FOSTER. The idea is this: If a school of mines and mining were established in each State and Territory of the Union that they are confined particularly to that State, they take up the subject as you

have in Colorado, for instance; you have schools of mines and mining there.

Mr. WALSH. Yes; but this is a subject which goes beyond the school of mining. The school of mines devotes itself to the utilitarian side of mining and not very much further.

Mr. FOSTER. If they take up the investigation, the means of getting the pay out of the low-grade ore, just as the Agricultural Department takes up the means of improving the arid lands, they do that in each State, in conjunction with the State agricultural colleges.

Mr. WALSH. Oh, yes; of course that is a question they are trying to solve, as well as other questions, but we have no great central authority.

Mr. FOSTER. No; but they would operate, like the Agricultural Department does at Washington, through the different States.

Mr. WALSH. They would cooperate with this bureau.

Mr. FOSTER. I do not mean to take the place of this, but I mean this department of mines and mining would operate through the schools of mines and mining in the different States.

Mr. WALSH. Certainly; they would be in hearty accord, of course. Yes, indeed, they would welcome such an institution; but I wish to impress again on the committee that so far as this work I have reference to is concerned, it is a matter of actual work, if I may use that expression; it is not a matter of theory, it is a matter of actual demonstration.

Mr. FOSTER. Then the school of mines and mining would take up the actual work——

Mr. WALSH. Yes.

Mr. FOSTER (continuing). The experiment work, which would have to be up to date if it was good for anything. If a school of mines and mining is established, that money would go for the teaching of the different methods, investigations as to treating the ores, say, in the State of Colorado, and it would be along those lines.

Mr. WALSH. Yes; it would be along those lines.

Mr. FOSTER. But to determine the chemical means and otherwise how to subtract that ore, that metal from the ores.

Mr. WALSH. Yes; but I certainly would advise the establishment of their own laboratory in one central point. I do not care where it is established, but it should be established under their control, not to look to any other institution for their final information or their final results, but to their own knowledge, because if they do not bring out something new, we do not want them. In other words, they must go beyond the information which is now obtainable from the different State institutions on these special lines; it is higher and beyond that.

Mr. FOSTER. The States do not give particular attention to that?

Mr. WALSH. No.

Mr. NICHOLLS. The States would get information from the bureau which they could give to the students attending the State institutions. It really would not interfere with the State school proposition at all.

Mr. FOSTER. There is no interference at all.

Mr. WALSH. The relations would be reciprocal.

Mr. NICHOLLS. This would be an investigating bureau and they would be outlets for that bureau

Mr. BARTLETT. In other words, permit me to ask you this, Mr. Walsh: Do you not believe that the mining industry of the United States warrants the establishment of a bureau of mines and mining, and that that industry also warrants assistance to schools of mines and mining for the same purpose, to advance the mineral industries of the United States? Do you not think one is an important factor as well as the other?

Mr. WALSH. Yes, if it can be obtained. They will be reciprocal and right in the same work. The school of mines of Colorado is doing a noble work in educating young men for mining engineers and metallurgists.

Mr. BARTLETT. I am speaking also of the State of Nevada, my own State.

Mr. WALSH. Certainly they would be reciprocal; but you asked me about giving Federal assistance to those schools in lieu.

Mr. BARTLETT. Not in lieu.

Mr. WALSH. Of course I would favor that.

**STATEMENT OF MR. GEORGE W. E. DORSEY, OF FREMONT, NEBR.,
DIRECTOR OF THE AMERICAN MINING CONGRESS.**

Mr. DORSEY. Mr. Chairman and gentlemen, I am very sorry that Judge Richards, the president of our organization, can not be heard by this committee. Very important business detains him, and I appear as his substitute.

I am very grateful to my friends who represent the great coal industry of the West for coming before this committee and aiding us who are mining precious metals in trying to secure a bureau of mines and technology. I have been greatly interested in the remarks of the different gentlemen composing this committee, and think that what they have said relative to the necessity of trying to prevent the awful accidents that have occurred in the coal mines in the past year should have the earnest attention of the Congress of the United States. Certainly when human life is at stake and the accidents are brought about by causes that we do not understand and can not in any way ascertain, the Government should lend aid in solving the problem; and it is through such a bureau, with its experts, that we can hope for relief.

I shall speak to you briefly regarding the work of the American Mining Congress. This congress is an association of mine owners and miners of the entire country. When first organized, it was for owners and miners of precious metals. But within the last three years we have broadened our work, and to-day we have a membership of many thousands engaged in the mining of all minerals known in the United States, as well as oil. The mining congress has been striving since its organization, for the creation of a bureau or department of mines and mining. The work that we ask to be done by this bureau is so varied that I shall but briefly touch upon one or two salient features of it.

You have already heard from the coal miners, and the testimony that has been given before this committee by men engaged in the mining of coal is certainly worthy of your consideration. Then you have heard my friend, Mr. Walsh, of Colorado, an expert miner, who

has been all his life searching for precious metals, and I am happy to state that he has been one of the fortunate.

The bureau to be created by this Congress should, in my judgment, be along the same lines as the Geological Survey. Under Doctor Smith, its able director, the Geological Survey is doing a great work for the mining interests of the country, and a bureau so formed, and with such a man as Doctor Smith as director or commissioner, who would be able to secure experts in the various lines, could do a great work in the testing of ores and the evolving of methods for the treatment of low-grade ores, and could in a thousand ways benefit the mining industry.

One great problem to overcome with the miners of precious metals is the waste in the mines. That is, we may have a vein of ore 10 feet in width. Two or 3 feet of this ore will carry values so that it can be worked under known processes at a profit. The remainder of that vein, running under \$3, with the present price of labor and the charges for treatment, is absolutely worthless. Let this bureau show how to profitably work this low-grade ore, which I will call (as my friends from the coal region have spoken of it) waste in the mine, unprofitable ore; let it show how that can be worked to a profit and made of commercial value. That is one line of work that this bureau of mines would take up.

Another suggestion is in regard to framing intelligent laws governing the location and the securing of patents to mining claims, and settling the vexed apex question. At present the clerks having charge of the mining division of the General Land Office here appear to be overworked. So are the surveyors-general of the different States, as it takes months to acquire title to a claim after you have paid to the Government the money for the property. This is one cause of complaint. The director of the proposed bureau would be listened to by Congress when he would suggest modifications of the present law and an increase of the force necessary to bring the business of the office up to date.

My friends from the coal regions were questioned as to the cause of the many explosions in the coal mines, and why the companies did not discover what caused the explosions. I have had but little experience in coal mining, but I know this, that the explosion at the Union Pacific mines in Hanna, Wyo., when nearly 300 men were killed, was caused by an explosion of gas or dust. No one knows which it was, nor how it was caused. In fact, after diligent work extending over more than a year, the officers of the Union Pacific Coal Company were compelled to admit that the cause of the accident was unknown, and it was impossible for them to ascertain it.

Another feature which I wish to speak about is (and the question has been asked here) whether we would recommend that the bureau be under the control of the Department of Commerce and Labor or the Department of the Interior. I should say the Department of the Interior by all means, as the Geological Survey is under the direction of that Department, and, as I said before, the two should work along the same lines. Let us have a bureau of mines and technology and the Geological Survey—one to give us an idea as to the location of the different veins, strata, etc., and the other, when the rich deposits were discovered, to work along the line of the development and the rendering of those deposits of commercial value. Millions could be

added to the product of the precious metals in this country if we could profitably work the low-grade stuff that to-day goes over the dump and is considered waste.

The gentlemen of this committee know as well as I the magnitude of the industry that we represent here, of the millions invested therein, of the great output of the mineral production of the United States. Perhaps this statement may be questioned; but it is absolutely true that 51 per cent of all the tonnage of all the railroads in the United States in the year 1906 was mineral products, either in crude or finished form. Some of my farmer friends who have seen the great trains loaded with cattle or loaded with wheat, oats, or corn going to the market may question this. But if they will go to Pittsburg (only one of the many centers of the country) and see the miles upon miles of cars loaded with the products of those mills, they will believe that the statement that I have made is absolutely true.

I earnestly request this committee to report a bill favoring the creation of this bureau. There is no dissenting opinion among the mining men of this country regarding the advisability of such a bureau. There is no opposition to it among mining men. So give us this, and I am sure that every one who aids in the creation of the bureau will, in the future, be proud of the work done.

I thank you for your attention.

**STATEMENT OF JAMES F. CALLBREATH, JR., SECRETARY OF THE
AMERICAN MINING CONGRESS, DENVER, COLO.**

Mr. CALLBREATH. Upon the prosperity of the mining industry rests the permanent prosperity of the country. The production of the money metals has always furnished the incentive for the production of other minerals. The fuels and metals furnish not only the sinews of war, but the basis of the nation's industries. Mineral production now is and always has been the most accurate barometer of industrial conditions.

Phil Armour once said:

I got rich when a young man by watching the coal and iron miners. When they were employed I packed every ham I could lay my hands on. My partner Mr. Plankinton, would say, "Phil, you will break us up." I would answer "No; they are working." When they quit I sold everything I could dispose of.

When the gold mines were furnishing the life blood of commerce the coal and iron miners were at work and those conditions were created which enabled the meat-packing industry to prosper. This illustration will apply with equal force to every other line of commerce and industry.

The importance of the mining industry has not been recognized by our Government. More than once the production of our precious metal mines has saved the nation's credit. The gold and silver of California and Nevada saved the nation's credit in the darkest hours of the civil war.

The low prices of labor and supplies in earlier days made it possible to operate low-grade gold mines at a profit, but that time has passed. The prices of American labor and materials are now so high as to render unprofitable the working of our vast bodies of these low-grade ores, which are now being thrown away. We can not lower the price of labor, for which demands from every source are increasing. There-

fore our production of precious metals must decline unless we find new and cheaper methods of treatment, which will enable labor to earn its wages and leave a margin of profit. Precious-metal mining can not prosper while the cost of production exceeds the value of the product.

Upon you, gentlemen, rests the most grave and serious duty of planning for such cooperation between the Government and the operator of low-grade gold mines as will enable such mines to be worked at a profit. It is for you, gentlemen, to initiate such legislation as will preserve a proper ratio between real money and credit money—between the foundation of gold and the structure of credit which it supports.

We are sometimes told that the balance of trade in favor of this country produces more gold than our mines; that the balance of trade in our favor for 1907 was approximately \$500,000,000, while our production of gold was approximately \$100,000,000. But I want to call your attention to the fact that during that same year our iron and steel exports exceeded our imports by \$131,000,000, our copper materials exported exceeded the imports by \$67,000,000, and in mineral oils the balance of trade in our favor was \$75,500,000. From these three items alone the direct product of the mines, \$273,500,000, more than half of the total balance of trade in our favor was derived.

The American Mining Congress believes that the industry which gives to the world the iron to build its machinery, the fuel which furnishes its power, the copper which instantaneously transmits its thought, the material for those chemical forces which are revolutionizing its industries, and the gold which measures its values is entitled to the bureau for which we are now asking.

We believe that the industry which furnishes more than half the tonnage handled by our railroads—without which all modern forms of agriculture, manufacturing and commerce would be impossible—the industry which employs nearly 1,000,000 men and which adds annually \$2,000,000,000 to the permanent wealth of the country is entitled to recognition and guidance from the Federal Government. We believe a bureau will be of incalculable assistance to the mining industry. The American Mining Congress, the Trans-Mississippi Commercial Congress, and the National Irrigation Congress, the three great commercial organizations of the West, and practically all of the mining organizations of the country have adopted resolutions asking for the creation of a bureau of mining technology in the Department of the Interior. The United Mine Workers of America, with a membership of 300,000, has, through its committee, presented to you its reasons for asking this legislation; the coal mining operators have presented their reasons; the precious metal mining interests are unanimously urging their claims for Government cooperation and investigation.

THE RESULT OF THE INVESTIGATIONS IN OTHER COUNTRIES.

In Great Britain, France, Belgium, and Germany government testing stations are now established and have been operated for a number of years for investigations looking to the prevention of mine accidents in those countries. In each of these countries one of the chief purposes of these investigations is to determine the conditions under which the different proportions of the different gases and the

dust met with in coal mines may be ignited or exploded; the quantities of the different explosives used in coal mines that may be safely used in the different percentages of coal gas, coal dust, etc.; the conditions under which the gases and dust in coal mines may be ignited through the use of open lights or imperfect safety lights; the conditions under which electricity may be safely used in coal mines where fire damp or dust is prevalent; and various other similar problems.

In Great Britain one such station has been established; in Belgium, one; in Germany, three or four; and in France one small station, now being supplemented by a larger one in process of construction in one of the more important coal fields at a cost of about \$60,000.

The success of such investigations can be more fully realized when it is remembered that at the beginning of such investigations in each of the above countries the number of deaths and accidents in the coal mines in each country was almost as great as it now is in the United States; whereas each year following the inauguration of such investigations the number of such accidents has steadily diminished, until the average for the recent five-year period is now as indicated by the following tabular statements:

Number of men killed for each 1,000 men employed:

France (1901-1905).....	0.91
Belgium (1902-1906).....	1.00
Great Britain (1902-1906).....	1.28
Prussia (1900-1904).....	2.06
United States (1902-1906).....	3.39

Experience in other countries has shown that such stations for investigation and research into the causes of coal-mine disasters should be located in a coal mining region where gases and other materials are available, and in that region where the greatest variety of dangerous conditions exist.

The advantage of such location is not only that the different gases and other materials are there available for use in the laboratories, but also the fact that the laboratory tests can be reproduced on a larger working scale in coal mines themselves.

The special legislative committee of the American Mining Congress engaged in this work is as follows:

Judge J. H. Richards, Boise, Idaho, chairman, president American Mining Congress.

Dr. Victor C. Alderson, Golden, Colo., secretary-president Colorado School of Mines.

Dr. James Douglass, 99 John street, New York City, president Copper Queen Consolidated Mining Company.

Mr. Thomas F. Walsh, Denver, Colo., and Washington, D. C.

Mr. John Mays Hammond, 71 Broadway, New York City.

Dr. H. Foster Bain, State geologist, Urbana, Ill.

Mr. John H. Walker, Springfield, Ill., district president United Mine Workers of America.

Mr. B. F. Bush, St. Louis, Mo., vice-president Western Coal and Mining Company.

Mr. Charles B. Dudley, Altoona, Pa., president American Society of Testing Materials.

This committee recently made a statement, which is in part as follows:

The American Mining Congress believes that the mining industry of the country has never received that Federal recognition to which it is entitled by reason of its impor-

tance as one of the two basal industries of the country, and it never needed recognition so much as it does at the present time. The magnitude and increasing complexity of the industry, the increasing difficulties which stand in the way of the progress of the individual miner, the large unnecessary loss of life through mine accidents, the wasteful destruction of the reserves of our mineral resources, and the stopping of placer mining in California and elsewhere are all matters of serious national concern and require prompt action by the Federal Government. The first important step in that direction which the Federal Government should take at its present session is the establishment of a well-equipped bureau of mines, which shall devote itself vigorously to the betterment of these conditions.

President Roosevelt, in his message to the Federal Congress, has recommended the establishment of a bureau of mines under the Department of the Interior with a view to the betterment of mining conditions and greater efficiencies in the mining industry and in engineering, building, and other industries based on mine products in which both the people and the Government are vitally interested.

I want to call your attention to a few of the many problems which need solution. Some years ago by order of the Federal court placer-mining operations in California were stopped because the deposit of tailings was damaging property situated lower down the streams. Property worth \$1,000,000 was made worthless by that decision. Golden California ceased to be "Golden California" in consequence. No solution has yet been effected, and none is likely to be through individual investigation.

A few months ago the enormous plant of the United States Smelting and Refining Company near Salt Lake City was closed on account of a court decision that the fumes from its furnaces were damaging farm crops in that vicinity. The closing of the smelter necessarily closed the mines, the ores of which it was treating. The smelter-fume problem has been under investigation for years in a small way, and no easy solution has been found. It is a problem general in its effect, vital in its consequences, and its solution should be effected for the benefit of all.

Recent court decisions have stopped the operation of stamp mills in Colorado, and similar results will obtain elsewhere on account of the deleterious effect occasioned by the running of tailings waters from stamp mills and concentrating mills into the streams. The individual can not solve this problem. Its solution is of general application and advantage and should be made once for the benefit of all.

Perhaps the most important subject after the protection of human life is the conservation of our mineral resources. In many low-grade mines the ore left in the ground is of greater value than that taken out, because its value is so low as not to permit its profitable extraction and treatment by existing methods. Ores carrying from two to three dollars per ton, associated with zinc, antimony, arsenic, or other deleterious substances can not be milled at a profit because of the penalty charged by the smelters for the objectionable contents.

While at Joplin last year an investigation by engineers and metallurgists developed the fact that over 40 per cent of the mineral values in the territory thus far mined in that district had been lost by leaving it to cave in the mines, or by waste in the mills. I will not burden you with further illustrations. The problems of mining, being scientific in their nature, require the highest order of intelligence for their solution. To enforce this upon individual interests is to create a monopoly of brains in this field as dangerous to the country as the monopoly of the means of transportation.

I want to impress particularly upon you that the proposed legislation will in no way conflict with the rights of States or of individuals. No State will be required to enact any new legislation except in response to the public demand of its citizens that the plan for the protection of human life and natural resources based upon the knowledge gained by the investigation may be made effective.

That 30 or more coal-producing States shall be required, each for itself, to make these investigations, entails a prohibitory expense and a duplication of work wholly unnecessary. We ask that the National Government shall solve the problem, and leave each State to apply its own remedies. No mine owner will be required to permit an examination of his mine (nor is any extended examination of mines anticipated), but will be left to apply to his own operations those facts which are demonstrated by the work of the bureau.

One of the most helpful agencies of our Government is the United States Geological Survey. Its investigations have set in motion forces which have been most potent in the industrial development of the nation. In response to a great public demand for technologic work it has been obliged to undertake activities outside the field of service for which it was created, and for which it is best fitted. This fact is one of the most forceful arguments for the creation of a bureau of mining technology which can be equipped with the talent necessary for the special problems which demand solution.

The letters of individuals whose opinions are entitled to consideration, the resolutions of all organizations interested in the subject-matter, the editorial comments of the leading papers, and technical journals of the country are practically unanimous in their indorsement of an act creating a bureau of mining technology.

Prominent coal operators from a number of the coal producing States of the East met in Washington January 9, and unanimously requested that the Government undertake the investigation of the causes of disasters in the coal mines. They resolved:

That the United States Government should take the necessary steps to determine the causes before any attempt is made to apply legislative remedies, but when the causes have been ascertained, and the remedies suggested we pledge ourselves to cooperate with the National Congress and State legislatures in the framing and passing of any proper and effective legislation for the protection of life or property which may result advantageously to the National Government, State, labor, and capital.

The legislatures of West Virginia and Kentucky unanimously adopted resolutions requesting their Senators and Representatives in Congress to favor the creation of a national bureau of mines.

On January 15, the coroner's jury at Fairmont, W. Va., in their verdict on the Monogah mine disaster, made this recommendation:

There are many unsolved questions connected with coal mine explosions in the United States. We recommend that Congress make an appropriation for the establishment of a bureau of investigation to aid in the study of the various conditions under which the explosions occurred, and as to how they may be prevented.

MINING BUREAU URGED BY THE MINING ENGINEERS.

If you will pardon me I will read to you short extracts from a few letters selected from a large number in such a way as to show that the sentiment exists in various localities and is voiced by men of varying interests.

Andrew Carnegie wrote in January last as follows:

I was delighted when I read the President's recommendation that a bureau of mines be established. Within the past month we have had two startling illustrations in western Pennsylvania alone as proof of its necessity. It is really a scandal that our country is so far behind all others in insuring the safety of the miner.

I shall take pleasure in doing anything that I can to assist in the work of pressing Congress to give this subject immediate and favorable consideration. I have the matter very deeply at heart.

R. A. F. Penrose, jr., 460 Bullitt Building, Philadelphia, Pa.:

I think the establishment of a mining bureau is of great importance and that it should have been started long ago. I have no doubt that this would have been done many years ago had it not been for the fact that most people who are not familiar with geological matters looked on the geological department as a sort of mining bureau and expected them to do the work which properly belongs to such a bureau.

I think that in recent years the Geological Survey has done as much for mining as one could reasonably expect; but we all know that that organization can never act efficiently as a mining bureau, and that such mining work to be done properly will have to be delegated to a separate organization. Of course the mining and the geological bureaus would necessarily be closely related, and doubtless many questions would come up regarding what kind of work belonged to one and what kind to the other; but I can see no reason why the two organizations could not be carried on separately and yet on amicable and mutually beneficial terms.

Edward H. Benjamin, consulting mining engineer, 903 Linden street, Oakland, Cal.:

Has it occurred to you that the increasing cost of mining is liable to stop the production of gold? A great many of the gold mines in California have been obliged to cease operations, and have become idle properties because the gold can not be produced at a profit. The Government will not pay the gold miner any more than \$20.67 an ounce for his product, and when the cost of producing that ounce exceeds the amount the Government pays for it then its production must cease. Of course there are some high grade mines that can stand the increased cost of production, but unless conditions become more settled or more efficient methods be developed, the majority of the gold-producing mines will have to go out of business.

F. H. Dalburg, mining engineer, School of Mines and Metallurgy, State College, Pa.:

The awful calamities which have happened in mining work of late should be prevented, and I think the opportune time has come when Federal legislation is a necessity.

L. S. Storrs, vice-president New England Investment and Security Company, Boston, Mass.:

In my opinion it is absolutely necessary for Congress to make some recognition of the vast interests joining with you in this matter.

A. Fox, president Northern Electrical Manufacturing Company, Madison, Wis.:

I do not know of any line of business to-day, unless it is farming, where there is so absolute waste, lack of method, and mismanagement as in mining, and I do not know of any more inviting field to-day for genius than the introduction of economics and new methods in mining.

S. H. Pitkin, first vice-president The Wellman-Seaver-Morgan Company, Cleveland, Ohio:

The writer and this company being closely associated with the mining industry of our country in all its various branches appreciate most fully and heartily the need of such a step, especially in view of the great loss of life through mine accidents which have recently occurred, which, however, is only one item requiring the attention and regulation of such a bureau.

Francis A. Thompson, professor of mining and metallurgy, the State College of Washington, Pullman, Wash.:

I take this opportunity of expressing my hearty cooperation and sympathy with you in your effort to promote Federal legislation along lines beneficial to that initial producer of wealth—the miner.

Regretting, as we all do, the recent and terrible chapter of accidents in the coal mines of Pennsylvania and West Virginia, I feel that this sacrifice of human life, appalling as it was, will not go for naught, but that it will become the fulcrum, resting upon which the American Mining Congress, as a lever, can press home upon Congress the claims of the industry it represents. So that “those who go down to the mine in skips,” as well as those who adapt the materials thus produced to the use of the artisan and manufacturer, will be protected and assisted in a measure commensurate with the importance of their product.

F. A. Prevet, consulting mining engineer, New York, N. Y.:

I am heartily in favor of such a step and the urging of such further action by Congress as will insure to the mining industry such supervision and fostering care as is now given by the Federal Government to agriculture and commerce.

Fred H. Dakin, jr., the Dakin Company, gold and copper mining, Berkeley, Cal.:

I am heartily in favor of the movement for a bureau of mines, and believe it will tend, in a large measure, to prevent the present unnecessary loss of life and excessive waste in the mining industry.

George A. Sonnemann, mining engineer, Spokane, Wash.:

The mining industry of this country has grown to such an extent that its magnitude entitles it to this recognition, and I have never met anybody who disputed the necessity for such a bureau. It seems to me that all that is necessary is to get the matter properly before Congress to receive the desired recognition.

O. L. Garrison, president, Big Muddy Coal and Iron Company, St. Louis, Mo.:

I can not too strongly recommend for your earnest consideration the serious condition that confronts the mining interests of this country and the absolute and early passage of some bill that will give relief. The enormous loss of life in the coal mines of this country during the past few years is most appalling. The establishment of such a bureau will make it possible to indicate how a saving can be effected in the great value of the minerals of our country, for I believe the waste is largely preventable.

N. E. Wadsworth, dean of the School of Mines and Metallurgy, State College, Pa.:

I desire to say that I am warmly in favor of the recognition by the United States of the mining and metallurgical industries which are so important. In this State the mining industry is much greater than the agricultural, and both are surpassed by the metallurgical. The mineral industries are certainly in need of recognition as much as are any others of the United States.

P. C. Waite, Bozeman, Mont.:

The reasons for the bureau are multiple and of such moment as to make one wonder that this bureau has not been established long ago. I would seek it first owing to the good it could do in the lessening of the loss of life, then for the power it could exert in the prevention of fraud, believing these two things alone of such importance as to justify the outlay and exertion necessary to lessen the damage done. Then, the building up of an industry which brings to this country the wealth yearly which mining and its allied industries do warrants all that is asked for by the mining interests.

F. P. Bayles, superintendent the Carbon Coke and Coal Company, Cokedale, Colo.:

I firmly believe that a bureau of mines should be established in the Department of the Interior and that such bureau should study all questions pertaining to the

safety of men working in or about mines. It is deplorable to note the tremendous loss of life and property during the past year or two in the coal mining industry from explosions of dust and gas. Although a great deal has been written in the mining publications on gas or dust explosions, yet you will agree with me that very little is really known about this subject, and that practically no real steps have yet been taken to put coal mines in a safer condition. To begin with, very few companies have the time or the money to devote to careful research and experimental testing of the probable causes of dust and gas explosions, and this class of work can only be properly taken up by Federal jurisdiction and expenses paid by Federal funds.

Frank Farington, vice-president for Illinois, United Mine Workers of America, Springfield, Ill.:

I am of the opinion that by proper Federal supervision of mining the loss of life could at least be reduced to a minimum and such holocausts as occurred recently at Monongah, W. Va., and Jacobs Creek, Pa., could be averted. I think you will agree with me when I say that such occurrences as these are a reflection upon those who are intrusted with the safeguarding of our people and upon this the twentieth century of civilized enlightenment.

C. Hutton Patterson, mining engineer, Denver, Colo.:

The wonder is that some forcible step on these lines has not been taken long ago. * * * Several years ago the writer had the pleasure of many close and friendly relations with Dr. Sterry Hunt, a household name and standard authority in nearly every branch of mineralogy and every mining country in the world, who oftentimes expressed deep regret at the apparent, as well as actual, "neglect and indifference on the part of the Government in overlooking the great store of wealth in the United States, not even coming second to agriculture."

By all means let a bureau of mines be established for this immense field of operations, so that the fullest rights of prospectors, locators, capital, and labor may have such protection as will insure the highest interests of the whole country, and all connected with this industry.

E. J. Schrader, assistant manager of the Minneapolis Copper Company, Cumpas, Sonora:

The unnecessary loss of life in mines through preventable accidents, and often as a result of criminal negligence on the part of mining companies, has made it imperative that some steps be taken by the Government to stop it. I know of nothing that could do it so thoroughly as a well equipped and honestly managed bureau of mines. The benefits to the economical side of the industry are too apparent to need discussion.

UNANIMOUSLY FAVORED BY THE PUBLIC PRESS.

The technical and mining press of the country almost unanimously urge that this work should be taken up by the Government. Mines and Minerals, one of the leading mining papers of the country, in its March issue says:

Whatever else Congress may or may not do, this appropriation of two hundred thousand for the investigation of methods of minimizing the accidents and dangers in mines and preventing waste in mining should certainly pass, since the technological branch has already shown that there is a field for its work in this country, and any failure to continue work already begun and looking toward a further investigation of the safety of mining conditions will be considered, in view of the recent disasters, a shirking of what is the plain duty of Congress.

OPINIONS OF THE PUBLIC PRESS.

Comments of the public press are equally unanimous in urging the advisability of the Government taking up the question of prevention of mine accidents.

The Washington Post of December 20 says:

Human lives are more precious than gold or any of the works of human hands. Let something be done to stop this criminal slaughter and quash that shameful indictment against us.

The Washington Herald of December 20 says:

* * * To what degree legislation may be depended upon to lessen the danger to human life now involved in coal mining is an important question, and there is bound to be a strong demand that our Government do what it can to minimize the elements of risk in what must always be a hazardous undertaking. * * *

The Herald, Boston, Mass., December 24, says:

* * * The hazard of mining can not be entirely eliminated, but investigation proves that the greater part of this loss of life could have been prevented. The fact that the United States is so far behind the rest of the world in this matter of protection for lives of miners will be startling to most people. The general supervision of the work of coal-mine inspectors in Territories was recently transferred to the Geological Survey, and an investigation has been started with a view toward substantially improving the service. Public sentiment should compel the legislatures of mining States to adopt a similar policy in regard to the working of mines within their jurisdiction.

The Post, Louisville, Ky., says:

* * * Many of those mine fatalities are due to a neglect of the first principles of the mining business—due to a lack of precaution against dangers that science has revealed and the existence of which every mine owner recognizes. If enlightened self-interest—that motive principle of the political economist—is dormant or absent, it is time that the law enlightened the mind of the men operating these institutions. Life is more precious than even fuel, and far more precious than profit.

The Register, Mobile, Ala., December 20, says:

* * * It is customary for the press to fall afoul of the mine owners, without too closely inquiring into the facts of the accident. It would be more to the point to demand that Congress should investigate mining conditions and discover what general regulations are adaptable to those conditions, for the protection of the lives of miners and of the company's property. Congress would not have the right to legislate on the subject, but it might be able to throw a flood of light upon it.

The Daily Bee, Omaha, Nebr., December 23, says:

* * * The difficulty of protecting miners may arise wholly from natural conditions, yet the need of more carefully safeguarding life and limb can not be disregarded. The recommendations of the Government experts might be enforced if necessary by Federal and State laws. The proposed remedy may cost something in money outlay, but it can not cost as much as the successive explosions.

The Evening News, Buffalo, N. Y., December 24, says:

* * * Inspection of coal mines throughout the country would bring to light deficiencies of equipment, improvisations in manner of working, lack of discipline, employment of men of insufficient intelligence for a dangerous calling, and the subordination of considerations of safety to the greed for gain. * * * The sooner this knowledge is obtained and placed at the disposal of Congress the better. Mining is too much of a trade secret. The time has come for the public and its representatives at Washington to know what really goes on in the dark underworld of American industry.

The Globe, Boston, Mass., December 26, says:

* * * The United States has failed thus far to make adequate provision by law for the safeguarding of the mines. While other countries have been acting in this matter, the United States has neglected it for many years. * * * The sooner Congress passes legislation on this subject in accordance with suggestions contained in this valuable report, the better it will be for all concerned.

The Courier-Journal, Louisville, Ky., December 21, says:

The great loss of life experienced within a few weeks from explosions in coal mines constitutes such a menace to those engaged in such an industry as should call for the most searching investigation with a view to minimize, if not prevent altogether, such deplorable mortality. * * * At all events, it is a problem the solution of which calls for the best efforts of science directed by laws sufficiently strict to prevent mine owners from exposing the lives of miners in their employ to such reckless destruction. * * * To subject the lives of miners to continuance of this dangerous and brutal disregard of human life would be as criminal as to tolerate the use of electric

wires for the transmission of light or power without insulation. It is a subject for solution by science, directed by law, and should not be left to the discretion of those who are influenced more by criminal greed than regard for human life.

The Chronicle, Augusta, Ga., December 21, says:

* * * If it is true that improper mining methods are being followed, the remedy should be applied at once. It is gratifying to know that a bill was introduced in Congress a few days since toward the establishment of a bureau of mines and mining, whose duty it shall be to look into all such accidents and to work for their prevention. If it is adequate it should pass, and if it is not, one that is should be drafted and enacted into law at this session. When too great carelessness exists forcible correction should be resorted to. The need is urgent; human life can not be so lightly reckoned with.

The Savannah (Ga.) News, December 21, says:

* * * There has been a great hurrah over the regulation of railroads and the making of them safer. The mines kill more men apparently, in proportion to the number employed, than do the railroads. Why not turn attention in that direction?

The Sun, Baltimore, Md., December 22, says:

* * * From all parts of the country come demands for early action by the Government. * * * It is, in the public view, high time for the National Government to set its various agencies to work to discover wherein our coal-mining system is behind that of Europe in protecting the lives of miners.

The Star, Kansas City, Mo., December 20, says:

* * * The betterments contemplated in such actions as Secretary Garfield is taking will be welcomed by everybody. * * * So the Roosevelt ideal that responsibility must be fixed finds expression in the demand of his Departments for supervisory legislation to protect human life precisely as it is manifested in the square-deal policies for business and politics.

The Post, Pittsburg, Pa., December 20, says:

* * * A tremendous demand for Federal regulation and control of mining is going to grow out of these awful disasters. * * * If the legislatures don't get properly busy at their earliest opportunity and if State inspection doesn't bestir itself, drastic Federal interference with interests which the State is supposed to look after may be expected. No law, however strict, can hurt one mine to the advantage of others if it be fully enforced. Operators are only responsible if they have failed to keep the law.

The Record, Wilkes-Barre, Pa., December 21, says:

* * * Following the coroner's jury verdicts there should be thorough investigation on the part of experts, appointed by some Government authority, to find out where the fault really belongs. It may be that economy deprives these mines of sufficient air to drive out the latent fires, needing only the touch of flame to send them on in the sweep of death. * * * Somewhere there is fault, and it should be found out. The country has been appalled and it will demand that the whole situation be made clear.

The Free Press, Detroit, Mich., December 21, says:

* * * Doctor Holmes gives us little hope for the future. There is an unknown element in the problem. He says that explosions will increase in number and destructiveness unless the Government is able to give operators and workers information concerning explosives, gas, and dust, which will enable them to protect themselves. Some success in obtaining such information has been obtained by European countries. Surely if Europe can do this the United States may. We don't want to burn blood-stained coal.

The Chronicle, Muskegon, Mich., December 20, says:

* * * But the example of Europe has shown what can be done to decrease the sanguinary character of mining work, and the United States should profit by it.

The Star, Newark, N. J., December 21, says:

* * * There is no graver duty devolving upon the authorities than to see that the miners get the full measure of protection possible.

The News, Newark, N. J., December 26, says:

* * * There has been no such study in this country, where the mines are under State jurisdiction, and such laws as we have are not invariably enforced. The President evidently recognized this fact when he recommended the creation of a bureau of mines under the direction and control of the Secretary of the Interior. Such a bureau, furnished with the necessary money for prosecuting its work, could and would inaugurate a series of scientific investigations concerning mine dangers and their prevention that would give the State lawmakers sufficient data out of which to construct intelligent mine legislation. That this investigation is needed is amply demonstrated by the mortality figures.

The Chronicle, Portsmouth, N. H., December 21, says:

* * * If Europe can safeguard her mine workers so can the United States, and some legislation along that line can not be too quickly passed.

The Sentinel, Milwaukee, Wis., December 20, says:

* * * The trouble is curable to a great extent as the European record shows; and the remedy must come with an informed and aroused public opinion insisting upon humane and advanced methods, and on the kind of inspection that inspects, and is not the perfunctory and casual formality of some holder of a political job.

The Star, Washington, D. C., December 20, says:

* * * The Federal Government has no direct jurisdiction over this matter, the mines being exclusively under State control. Nevertheless an imperative duty confronts the United States in the premises, accented by each new addition to the appalling record of underground disasters. It must conduct a searching investigation into the causes and circumstances of these catastrophes beneath the surface, in order to point out the remedy if it can be found.

The Press, Pittsburg, Pa., December 19, says:

* * * Industrial carelessness has wasted more lives in Christian America than war. Is it not high time that this wanton slaughter shall cease? And will not the public conscience see that it does cease once the overshadowing part that negligence takes in it becomes generally understood?

The Dispatch, Pittsburg, Pa., December 25, says:

Mine experts representing the French Government are here to make exhaustive investigation of the explosions which have recently occurred. * * * Their visit will attract attention and it is within the bounds of probability that their report upon these disasters may give this country valuable information on the means of preventing such horrors in future. It is imperative that our mine operators and our legislators should learn from some source.

Journal, Kansas City, Mo., December 22, says:

* * * Two appalling catastrophes which have occurred almost simultaneously and which have resulted in the blotting out of more than 500 lives are supposed to have spurred the Government to undertake an investigation which really should have suggested itself long ago. * * * It may be taken as a foregone conclusion that scientific study of the firedamp and other menaces of the mines will at least mitigate the situation and minimize the danger, if indeed it will not completely remove the cause of these lamentable affairs. * * * The movement decided upon by the Government is certainly a timely one.

The Herald-Transcript, Peoria, Ill., December 23, says:

* * * If the Federal Government has any jurisdiction in the matter it should lose no time in acting.

The News, Des Moines, Iowa, December 22, says:

* * * What are we going to do about it? We are not mine experts. We can not lay our finger on this oversight and that mistake. It is impossible that we—or you—should say whether this inspector has done his duty faithfully or shamefully. All we know—and all you know—is that death is lurking in the coal mines. * * * The President has recommended a bureau of mines to safeguard the lives of men in this enormous industry. * * * If the States wherein Providence has stored our supply

of coal will not provide adequate laws to protect the miner at his task and his family, if they must be kept poor, then let Congress provide national legislation that will reach this shame of American industry.

The Chronicle, Pittsburg, Pa., December 23, says:

* * * Congress must investigate. A competent commission of inquiry must be designated to find out why in the mines of this country the casualties are three times as numerous as in the mines of Europe. * * * Endeavors to remedy this order of things by State legislation have not been rewarded with the desired results. * * * It is, then, not only advisable, but it is a matter of positive duty that Congress should take up this question and consider it earnestly in all its phases. The best and most reliable experts should be employed and through the information thus obtained perhaps the means may be indicated of putting a stop to the slaughter of human beings in the mines.

The Leader, Pittsburg, Pa., December 20, says:

* * * This enormous sacrifice of life demands prompt action by both State and National governments, and there is no better way for dealing with the question than through a national bureau of mining, such as President Roosevelt proposed in his last message. * * * The national bureau could deal with questions relating to the prevention of accidents by directing the study and research of experts and by cooperating with the States in making regulations and inspection more efficient. The cost of such a bureau would be trifling. But no matter what it would cost, it is a duty that the Government owes to the men who risk their lives in the mines to protect them from needless danger.

The Pittsburg Press of December 20 says:

The slaughter of miners a national disgrace.— * * * There have been four of these accidents with a total loss of life, including yesterday's, of over 800 lives. Where is this thing going to end? * * * The sooner we have a drastic reform in this country the better. The sacrifice of miners' lives has become a national disgrace. * * * It is too early to tell what caused the blow up in the Darr mine yesterday, but what reason is there for believing that this "accident" differs from any of the others? They are all alike. The simple, damning truth is that with all our boasts about our country as the one place where a man without regard to circumstance or rank and where human life possesses a sacred value merely as human life, this is the country where more crimes are committed against humanity in the name of business than in any other. * * * President Roosevelt wants Congress to authorize him to establish a bureau of mines, which shall investigate the mining industry and recommend to Congress such legislation as is needed to protect our miners from heedless hazard. Why does Congress hesitate to take the step? The States have failed to perform their duty in this matter as in many others. Decency and humanity unite in appealing from the barbarous negligence of the States to the nation.

The Kansas City Journal, of December 22, 1907, says:

* * * The States have adopted so-called protective measures from time to time, and thus have combated the danger as much as mere legislation could, by requiring inspection, fans, and other appliances. But despite these precautions the miners have taken their lives in their hands every time they entered the mines, for the root of the danger has not heretofore been attacked. The Government, so far as known, has not turned its attention to this subject. It may be taken as a foregone conclusion that scientific study of the fire damp and other menaces of the miners will at least mitigate the situation and minimize the danger, if, indeed, it will not completely remove the cause of these lamentable affairs. Human life is proverbially cheap in the industrial world, and perhaps nowhere has there been such a startling proportionate loss of life as in the coal mines. * * * The movement decided upon by the Government is certainly a timely one. It can not restore to their families and to the productive citizenship of the country the victims of past disasters, but it can at least make mining safer for the future.

altimore Sun of December 22 says:

Senator Scott, of West Virginia, introduced in the United States Senate yesterday a resolution providing for an investigation by a commission composed of Members of Congress of recent disasters in coal mines in Pennsylvania and West Virginia. This commission will report to Congress the results of the inquiry conducted by it. Furthermore, the resolution directs the commission to submit such recommendations for the protection of miners as the investigation may show to be proper and practicable.

Congress ought to authorize this inquiry without delay. Human life has not yet become so cheap in the United States that either the American people or their representatives in Congress can view with indifference the frightful disasters in the coal mines of the country in the last few weeks. It is the duty of this Government to undertake at once to reduce the perils to which the coal miners are exposed. The governments of European nations have already recognized their responsibility to protect miners as much from their own negligence and ignorance as from certain dangerous conditions, inseparable from coal mining, which can be minimized by strict regulation and scientific precautions. We can not doubt that the mine owners of the United States will readily cooperate with the Government in improving the condition of coal mining. It is not merely an economic question; it is a question of simple humanity. Surely American resourcefulness and progressiveness will not be satisfied until we have secured for the men who work in American mines conditions of employment as safe as those which European miners enjoy.

From all parts of the country come demands for early action by the Government. The country has been deeply shocked by the catastrophes in American coal mines this month. The slaughter of miners seems to be in a certain degree an almost wanton destruction of life. * * * It is, in the public view, high time for the National Government to set its various agencies to work to discover wherein our coal-mining system is behind that of Europe in protecting lives of miners. There can be no reasonable and worthy objection to the proposed investigation. Considerations of humanity demand prompt action for the protection of the miners. The Government of the United States has the advantage of knowing in advance of its own inquiry what Europe has accomplished by scientific regulation: We also have our own experts. We are thus in excellent position to institute reforms. * * *

AN EMERGENCY.

We are asking this legislation not because we are entitled to it, but because the country needs it. Upon each working-day of the year 1907 ten lives were sacrificed in order that the demand for mineral production could be met. Many of these losses were in metal mines, and many of them could have been prevented by the work of investigation contemplated for the mining bureau. It is believed that at least one-half of this loss is unnecessary. If five American citizens, without just cause, were being executed daily by a foreign government Congress would declare war and appropriate a hundred millions for its prosecution within two days.

Shall we be less mindful to an equal sacrifice made to satisfy our own commercial needs? Shall we not rather pay the price of increased mineral production in intelligent investigation rather than in human life?

INDUSTRIAL STAGNATION; INTELLIGENT INVESTIGATION; HUMAN LIFE.
WHICH PRICE SHALL WE PAY, GENTLEMEN?

The practical unanimity with which those familiar with the needs of the mining industry are asking for this legislation ought to convince you gentlemen that there is great need for your action. The purposes to be served we hope will appeal to the wisdom of our national representatives.

First. The protection of human life in mining operations.

Second. The prevention of waste of our mineral resources.

Third. The solution of those problems of economical production and reduction of low-grade ores, which must be met in order to enable production to satisfy the increasing demands of commerce, and which being of general application can not be solved by the individual.

(The committee thereupon adjourned.)

COMMITTEE ON MINES AND MINING,
HOUSE OF REPRESENTATIVES,
Washington, D. C., Monday, March 30, 1908.

The committee met at 11 o'clock a. m.

Present: Representatives Englebright (acting chairman), French, Beale, Lee, Bartlett, Foster, and Cale.

Present, also, Hon. W. M. Stewart, ex-Senator from Nevada.

Mr. ENGLEBRIGHT. Gentlemen, Mr. Huff is unavoidably absent, in Pennsylvania. He has requested me to call this meeting to order for the purpose of hearing Senator Stewart. He desires that any business should be delayed until he can be here. He is very much interested in this subject, and would not like any action to be taken unless he was personally present.

You understand, Senator, this committee has before it for consideration a number of bills providing for a bureau of mines, or something of that character, to assist the mining interests in every way that is proper; and more particularly with respect to the great number of coal mine accidents that have happened in the last year. I note that within the last few days we are having very serious trouble in the coal mines in Wyoming. They are having very great loss of life. That has brought this subject very prominently to the front at the present time. We have had numerous representatives from the coal-mining interests here, who were all very anxious that something be done by the Government in the way of taking up this subject for the benefit of the coal mines. Of course the mining interests all naturally go together, and we would like to hear from you as to what a bureau of this kind could do for the metal miners.

STATEMENT OF HON. W M. STEWART.

Mr. STEWART. Gentlemen, this is a more important subject than the public at large generally suppose. When gold mines were discovered in California the people of the United States were almost entirely destitute of information as to the extraction of gold and silver from the materials in which they are found, particularly gold. At first in California they used pans, as they found the Mexicans using them, to wash it out. The Mexicans had mined for a long time, and when they were mining on the little streams they would wash it out in a little pan.

Then they used, I think, rockers. I do not know where they got them from. They were about the size of a baby rocker. And pretty soon they commenced applying quicksilver. They could only work the free gold in the placers along the rivers, as they followed up the ravines. Later on a gentleman from Georgia by the name of Amos T. Laird came.

Mr. ENGLEBRIGHT. I was well acquainted with him before he died.

Mr. STEWART. He used the "long Tom" at first that they used in Georgia. That was a box 10 or 15 feet long. They threw the dirt into it and it washed down. At the lower end it had quicksilver in it, and they would catch it in the quicksilver. Then he had another method, which also came from Georgia, of digging trenches in the sides of the mountain and running water through them, catching it in that way and then working it through the long Tom. They called that method "hydraulicking," and out of that grew the hydraulic

mining. Then they went on and invented all sorts of machinery to tear down the mountains by hydraulic machines. That was stopped by injunction, because it filled up the rivers.

Then came the Comstock, and on the Comstock, near the surface, the ore contained both gold and silver. They used their sluices and long Toms, and they then got stamp mills of the very roughest kind and amalgamated in them and saved what gold they could. They did not think of trying to save the silver. It is estimated that in the first four years, until they got better methods, as much as \$50,000,000 in value went down into the Carson River for want of knowledge of how to save it. They then invented a pan tool to work it by the pan process. I assisted them to the extent of \$60,000. They got to quarreling and got into the courts, and although their invention is used up to this time, both of the inventors died poverty stricken.

Then, since that time there has been constant experimenting all over the country, in working different kinds of ore, so that they can extract the metal from almost any kind of ore. Wherever they can find the metal, somebody can extract it, but there is no means of collecting information so that they will not be doing it over and over again. There will be a mining camp located at one point, and another 20 miles away, and they will each be making experiments, perhaps on the same line. Those who are making experiments and making a success are generally reticent. They do not care to publish the information at all. They want to know how to work their particular ore.

Mr. ENGLEBRIGHT. Do you find, as a rule, that the mining men that make these experiments, and who get practical results, are in the habit of writing books?

Mr. STEWART. Oh, some of them have written books, but they do not do much of that. They are busy with other things. The best of them do not write books. It would be an enormous subject, and if the information that each one acquires by experiment could be properly preserved and explained in a simple way, so that the information could be used without going over the same thing again, it would be of great benefit. They have spent millions and millions going over the same thing, and getting the same result. They have used cyanide in one place some twenty or thirty years for extracting gold, but it is a new thing in many of the camps now, and if they can not find somebody who is an expert they go to experimenting, and they spend a very large amount of money. At Denver they have been experimenting very largely in the last twenty years. The men go there and take their ore there; whereas if the information was properly collected and preserved in books they would not have to do it over and over again. That would be of immense use if the information could be collected. It is quite as important as the information they collect with regard to agriculture, and more so, because more people know about agriculture than know about mining. The mining industry in this country is only second to agriculture, and almost surpasses it, taking the whole range of mining, including coal mining and gold mining.

Mr. FOSTER. It is greater, is it not, than agriculture when you take it altogether?

Mr. STEWART. Altogether I think it is greater than agriculture. Then they have passed laws from time to time as to what shall be

done to protect life and to make the mines secure, but the legislatures are not well informed as to what laws ought to be passed. These accidents in the coal mines could be avoided to a great extent, I apprehend, if you had proper appliances, and the legislatures would pass laws to enforce them if they knew what to do, but legislating in the dark they have not been able to reach the difficulty. They tried it in California and in Nevada, but ordinarily they do not do it intelligently. They require a certain number of shafts, etc., for ventilation, and the expense makes it impossible. If they would settle the question of ventilation and then lay down practical rules, the miners would be glad to follow them. There is no branch of industry more important than mining, as I said, and there is nothing more important to mining than the collection of information. Agriculture has been very much improved by the Agricultural Bureau. We have had it a long time. Much can be saved in results when the mines can be preserved and the metals not wasted as they were in the case of the Comstock. There they did waste a great deal, and they do in many places waste a great deal of the product because of want of knowledge as to how to save it. Millions could be saved in that way. Millions of expense in the way of new experiments could be avoided if the information could be collected and disseminated. This is a kindred subject to geology, but geologists do not usually find mines. They can not supply the information required. They are not organized for it, and they have been unlucky in finding mines. The experts do not find mines, but they can be very useful in telling others what has been found and in devising plans for ventilating and draining and securing against accidents. There is the place for the experts to work to great advantage.

It seems to me that the bureau should be, of course, in the Interior Department, the same Department that has the Geological Survey. It should be in the same Department because they are kindred subjects, and they could help each other.

Mr. ENGLEBRIGHT. Senator, have you any idea of the quantities of low-grade ore that can not now be worked to a profit that will ultimately be so worked?

Mr. STEWART. No man can estimate that. In some districts they work a much lower grade of ore under similar circumstances than in others. No man can estimate what could be done if we only had knowledge enough to work to the practicable limit. But they go into a mining camp, and may work it to the practicable limit with knowledge of extracting, etc., and they go away from it and it becomes an abandoned camp, and everything is lost there. Suppose in the Comstock they had known what they do now in the way of mining. Why, they would have taken out probably twice as much from the mine. It is estimated that they took out about \$600,000,000. They would certainly have taken out twice that amount if they had known as much as they do now about how to work. In order to be valuable, when I first went on the Comstock, the ore had to run from \$75 to \$100 a ton to do anything with it. Now if it is \$4 or \$5 a ton they make money on it.

Mr. LEE. Will it ever be possible to again work that ore which was discarded?

Mr. STEWART. It will be possible in some places; but it goes into the rivers and the ocean and it is lost.

Mr. LEE. That is a loss.

Mr. STEWART. Yes; lots of it is. The silver sulphurets are dissolved down in the mud of the valley, and it would be impossible to reclaim that at all. You can reclaim the gold better than you can the silver. The silver dissolves and goes into the mud more rapidly and completely than the gold. They are dredging in California now in the bottoms of those rivers, digging it up, and saving a good deal. You can save gold, but when it gets scattered in the big rivers, in millions and millions of tons of mud, it is very expensive trying to reclaim it, especially when you had it in small compass in the beginning.

Mr. ENGLEBRIGHT. What is your idea, Senator, of the unknown mining fields that we still have?

Mr. STEWART. The unknown mining fields? Oh, I think that of course they are not inexhaustible, but they are for all practical purposes. I think the gold mining is less liable to be exhausted than the coal mining, or anything of that kind; but it may fall off terribly. As long as it is used for money, that is the calamity that destroys. I could write the history of mining if you would give me the history of periods of prosperity. I can tell what the mines were doing at that time, because since the precious metals have been used for money civilizations have sprung up when the mines were productive, and they have gone back into barbarism when they were not. Why, some time before the beginning of the Christian era, mining was at its climax. About one hundred years before the commencement of the Christian era, in Spain, Italy, northern Africa, and Asia, gold and silver mining prospered. The ruins have been examined there. They are there yet to show what vast excavations they made there; but they went to their limit. They did not have the same means of draining that we have. It was very crude, and even after mining was revived in Mexico and South America, they had great difficulty. I have been down there, and they would put one round shaft about 12 or 14 feet in diameter, in the middle of the district, and then they would have "wins," they called them, with about 30 or 40, or maybe 100, horses on them, and they would haul it up with rawhides. They went down and excavated to water. Our people were disappointed when they found what had been done in that way, but that was regarded, as we are told by historians, as a wonderful improvement upon the methods the Romans had when they worked in Spain and Italy. They could not get the water out, and the mines were practically exhausted, and the volume of money grew less and less at that time.

At the time they had the mines it was estimated by Jacobs—he took the reports of the Emperors—that they had about \$1,800,000,000 in our money in gold and silver coin in the Roman Empire. That dwindled down to less than \$100,000,000 in fourteen hundred years. It kept getting harder and harder to secure it, and there were a great many famines. Jacobs says that during that period they lost the art of separating the precious metals from the gangue in which they were formed, and they had to go back and find it out by new experiments. They had not preserved the records in order to find it out. It had gone down by tradition only, and they could not do anything with the metals until they had worked at it a great many years.

When they got to Mexico and South America they found that the natives had advanced considerably in mining and had a large amount on hand. That gave them a start, and they then adopted the methods the natives had in Mexico and Peru. Then they improved

on them. They worked their ore. They had the sulphuret ore that we afterwards used the pan process for. When we put in the pan process, we would put in steam and heat up the quicksilver, and then have arms around that would grind it to a certain extent, and bring the quicksilver in contact with the metal, and thus extract it. To do that in Mexico and South America, where they sunk those deep shafts, they would have a round place, probably 50 or 100 feet round, with a stone floor, and they would put in their quicksilver and their powered ore, which had been ground in some form. They would put it in, and they would put mules or horses in there, and the heat of their feet, as they tramped around, would bring the quicksilver in connection with the ore. That suggested to our people that they could make a pan and put steam in it and heat it up with that quicker than they could with the hoofs of animals.

So that the wonderful genius that has been applied to the extraction of ores, if it could be collected without having too much scientific bosh in it and told in plain language, would be immensely useful in a bureau of this kind; but you want a man at the head of it with a good deal of common sense, and who will collect about him those who know something to help him. He must not know it all. If he does, he will not know anything. You want a good man. I like that bill that provides for a director at \$6,000. I would like him to have more than that. I do not think you could get a man for less than that to take hold of the work. If you did, it would do more harm than good. It might mislead the people. You want a man of common sense, a practical man, at the head of it. You can not get a man who is fit at all for less than \$6,000. What do we pay the Director of the Geological Survey?

Mr. BARTLETT. I do not really know, Senator. It is \$6,000, though, I think, or \$5,000.

Mr. CALE. What are the salaries that are usually paid to professors in the various institutions of science?

Mr. STEWART. This position would carry more responsibility than the ordinary responsibility of a professor. I think you have fixed it about right at \$6,000. I would have it in the same Department that the Geological Survey is in, but not connected with it. Have it separate, for the purpose of collecting and disseminating information, like it has been in connection with agriculture. That has been useful. I would make that the basis for it. It will ultimately grow into a more important department than agriculture, and more interesting, because the treating of metals, the ventilation of mines, the pumping of water to drain them—all these things are immensely interesting and very valuable. Just think of Jacobs. He dug for thirty years for the secretary of the treasury—or whatever they call him in England. He dug thirty years to get information for them. He devoted his life to it, but he found they had lost the methods of extracting ore during the Dark Ages, when mining stopped.

Mr. ENGLEBRIGHT. It would seem so if, when they discovered gold in California, the only method they knew was to simply use an ordinary pan to wash it out. They were going back very close.

Mr. STEWART. For several years they did the roughest kind of work in California. When gold was discovered in Nevada nobody knew what to do with the ore. It was accidental that they found out what the Comstock black sulphuret ore was. It contained about

\$4,000 to the ton on the surface. Some miners, you know, had worked along up the ravine from the Carson River, and in the spring they would have a little water, and they would wash it out in their "long Toms," etc. They would work along up. They did not do very much for several years, six or eight years. One of them happened to have been in Grass Valley, California, and he put some of that in his bucket and took it over. They had an assay office there and they found out what it was. When that news spread, I went over myself. Everyone flocked to it in the fall of 1859. There would not have been a miner in the whole country, if it had not been for that assay office, who would have known what the silver ore was.

Mr. ENGLEBRIGHT. Did you know old man Ott?

Mr. STEWART. Yes.

Mr. ENGLEBRIGHT. Now, Senator, take the later discoveries in the State of Nevada. Was not the gold found under conditions under which they had not found it previously, and on which they were not posted previously?

Mr. STEWART. Yes; the conditions were very different. The Comstock made Nevada. When Congress passed the law making it a State we had about 75,000 inhabitants there, in consequence of the Comstock. That gold ore we could work in pans. It would run about 75 per cent or 80 per cent, in pans. We called it free-milling silver ore. The whole State was prospecting for that wherever they could go. They could not prospect the southern part of the State on account of not knowing where the springs were. Then, at Eureka, they found silver ore that had all the necessary elements for flux. They took out over one hundred millions there. They were looking for those two grades alone. They could not find it in exactly the same form at all. I had been at Goldfield forty years ago or more, and had a good idea that you did not want to go much nearer the desert than that. There was a spring there where there was a sheep herder. I passed through there and went to a place called Montezuma. They had a public meeting there in 1868. They had about 150 men in there, but they left. You may have been over there in recent times, Mr. Bartlett?

Mr. BARTLETT. No, sir.

Mr. STEWART. You know the place?

Mr. BARTLETT. I know where Montezuma is. I have not been there recently. That is a very old district.

Mr. STEWART. I was there in 1868.

Mr. BARTLETT. Since you have gone into the subject of the new conditions that have been discovered every day, I would be glad to have you call the committee's attention to that—the new conditions that are being found every day.

Mr. STEWART. The discovery at that place was accidental. There are various stories about somebody discovering it in the earth there not a great way from this spring. A sheep man happened to see a particle of gold, and that started him to examining it. It was just so with the discovery at Tonopah. That was purely accidental, the same as in the case I have just spoken of. It is a curious fact that formations that people passed over and laughed at, we found our richest mines in, contrary to the theory of the geologists—because we found gold in Nevada really in violation of all their theories. They said it could not be there.

Mr. ENGLEBRIGHT. You mean in the rhyolite formation?

Mr. STEWART. In the rhyolite formation and other formations, where there were different kinds of rock. There was some rhyolite and some other formations that they said it could not live in. We found it in various formations. Nevada is a mineral State, and if anybody goes there with the theory that he is going to find it in the same condition that you would have it in Alaska, Mr. Cale, or anywhere else, he would get fooled; but if it is recorded in what formations it has been found, they will not condemn any region of the country.

Mr. CALE. Is there not a great deal of it, Senator, in Nevada, that is found in the porphyry formation?

Mr. STEWART. "Porphyry" is a pretty extensive term.

Mr. CALE. I am speaking simply from the miners' definition of porphyry.

Mr. STEWART. I find that even then it is pretty wide. Rhyolite is a species of porphyry.

Mr. CALE. Technically speaking, that is true.

Mr. STEWART. They used to get crazy if they found a little place that looked like the Comstock porphyry. That is, a sort of bird's-eye porphyry. All this erupted rock is altered rock, and it is a kind of porphyry.

Mr. ENGLEBRIGHT. You think, then, Senator, that there is a pretty large field for investigation and further information as to the different kinds of rock that gold is found in?

Mr. STEWART. Yes.

Mr. ENGLEBRIGHT. And the other materials?

Mr. STEWART. Yes.

Mr. LEE. You think there is a good deal to learn yet in the mining and in the treatment of ore?

Mr. STEWART. We are just in its infancy.

Mr. ENGLEBRIGHT. In Mr. Lee's State of Georgia, they have been mining how long there?

Mr. LEE. Oh, away before the war; in the forties, and earlier than that.

Mr. ENGLEBRIGHT. Do you think it is possible that there are mineral deposits in the State of Georgia that they do not know anything about at the present time?

Mr. STEWART. I think it is not only possible, but almost certain that they have vast deposits from Maryland down to Alabama, right through Georgia. I have followed that down. I was foolish enough to spend pretty nearly all of a summer on it and about \$10,000 in looking it over. I invested in a mine down there, but it required more expense than I was willing to go to to work it.

Mr. BEALE. How long have you been in the mining business, Senator?

Mr. STEWART. Not quite sixty years. About fifty-eight years.

Mr. LEE. With improved mining methods do you not think there is a great deal of gold in Georgia that could be extracted?

Mr. STEWART. That is what we found on this range. They found a placer range, and that is where our friend Lodge got his opinion.

Mr. ENGLEBRIGHT. He brought that from Georgia? That is new to me.

Mr. BEALE. We have mines right over in Virginia.

Mr. STEWART. Yes; I found that they found it near the surface and the negroes had picked it up and worked around with it in the ravines.

Mr. LEE. Where was that?

Mr. STEWART. That was here in Virginia, and all along down this range. The range was 300 miles long there—fully that. There was a gentleman named Williams, a banker down there, from Richmond. He brought some specimens that they had found in the ravines, and he wanted me to go down to see it. What is that river that goes down through Richmond?

Mr. LEE. The James River.

Mr. STEWART. It was the river that comes down through Richmond, from up about 60 miles above the town. I went down there, and we went up to where they had found it in the ravine. He had about 20 or 30 men digging across to find where it came from. They were in the alluvial dirt. There was not less than 30 or 40 or 60 feet of earth before they got to that. I said "That is no use. Let us see where the mines are." They took me around right where there were croppings. We found quartz croppings, and finally we came to where Commodore Stockton had worked previously, and where there was a large number of buildings. There had been an expenditure of three or four hundred thousand dollars, and it was rotting down. I found that for about 60 feet down the ore was oxidized, so that they could amalgamate it and work it. When we got below that, where it came to the water level, it was iron pyrites, and they could not work it with ordinary appliances. You will find that all the way down, clear through that State—that when you get down to water it has not been oxidized by the atmosphere, and it is more rebellious.

It is only a question of time when they will have appliances to work that rebellious ore, and there is a great future for Georgia and for this country here, whenever they get down to a principle where they can work it. George Hurst went down and bought a mine down there and put up a mill and spent a little money on this range. I do not know where he was. I think he was in South Carolina; but he had some experiments made, and he told me it was no use, that no matter how much you found of it, it was too expensive to work it, and that he would not live long enough to get a method of working it; and he threw it up. Several other mining men from California had been down there, and they made an examination of this mineral belt. There is no doubt about the fact that it is a great mineral belt, and that there is a vast amount of gold in it. Whether the time will come when we will have sufficient scientific knowledge and suitable appliances to work it or not is a question; but I do not see why it should not. The limit of gold mining is not going to be reached in the next century, but the limit of coal mining may be. A bureau of this kind could examine that question and furnish an immense amount of information which would be valuable to the world. We ought to know what we are coming to, and I think it would be a more important bureau than the Agricultural Bureau.

Mr. ENGLEBRIGHT. That is because you have been engaged in mining for sixty years, is it not, Senator?

Mr. STEWART. Not quite sixty years; only fifty-eight years.

Mr. BARTLETT. The Senator is also the author of the first mining law that authorized the acquisition of mineral lands in the United States.

Mr. STEWART. I had a great fight when I came here. Such a fight I never expect to have again; but that is not material to this case.

They proposed to sell the mines at auction to pay the national debt during the war. A man named Julian was chairman of the Committee on the Public Lands. He was a very able man, and was elected twice in Indiana on that platform. We had a very lively fight keeping the mines open to exploration and development. But that would not be interesting to you. I did some trading then.

Mr. ENGLEBRIGHT. We have heard of it.

Mr. STEWART. But the mining laws may be amended. It is pretty hard to do it, though. They may be amended. But they have kept the mines open for exploration, and they ought to be. They had better be on the public lands and open for exploration, because nobody will submit themselves to the hardships and privations necessary to find mines for money. You can not hire men to find mines. The miner is full of hope. He is an enthusiast. He will spend his whole lifetime in looking for mines. He may never find anything, but you have an army of them out, and they will stay out if you let them be free, and give them a chance. I think there is nothing like giving them a chance to find the mines, and they can if you will keep them open. In Mexico they have gone so far as to keep them open all the time. By the theory of the law there you can go right into a man's dooryard and open a mine; but they have a sort of a custom that if they do it they shall make some negotiations with the owner of the land, to let them in, etc. So they get along in that way. Americans have gone there disregarding the secret customs, and they have got killed, and we have had some little trouble with Mexico about that matter. But there the mines are open to exploration and development, no matter if the whole land is in private hands and they intend to keep it. When the railroad grants were passed there was a reservation of lands. So the Supreme Court, I believe, decided that after a patent was issued the land belonged to the railroad. The railroad does not want it. A whole lot of our mines are on railroads. So the railroads had better adopt the Mexican plan and let anybody who finds a mine announce it. The railroads do not want them.

Mr. ENGLEBRIGHT. You mean the railroad lands?

Mr. STEWART. Yes; the grants are immense. The Northern Pacific had 40 miles on each side, 80 miles across there, and all these railroads have these large grants. I see they are investigating, and all that sort of thing. If I owned all the railroads, I would adopt the Mexican plan.

Mr. LEE. They have acquired pretty valuable coal mines?

Mr. STEWART. The railroads?

Mr. LEE. Yes.

Mr. STEWART. They have acquired them. The Supreme Court decided that after a patent was issued nothing more could be done. It might be patented, and no mines appearing, a patent would be inadvertently issued, and nobody would oppose it. That is unfortunate for the railroads, I think, more than for the people, because if they have mineral lands along the line they had better have the people hunting the minerals and get the benefit of the transportation. That is the way they get more money out of it, because they can not get any race of men that will find it but miners.

Mr. ENGLEBRIGHT. We have only a few minutes more, and I suggest that if any member of the committee would like to ask the Senator any questions he would be, I am sure, pleased to answer.

Mr. BARTLETT. I think the Senator has covered the subject very fully, and I, for one, am very grateful to him for it.

Mr. STEWART. Not at all.

Mr. BEALE. I think it is due to the Senator that the committee should return a vote of thanks for his remarks.

Mr. CALE. I suppose one of the main objects of this bill, or of the bureau, if we establish it, is to get such information as will prevent, if possible, these serious accidents that have been happening of late. I think that is of more importance, really, than a technical knowledge of minerals, rocks, or of the financial end of mining itself.

Mr. ENGLEBRIGHT. We have had that subject up with the coal operators and also with the mine workers, and they all agree that what is needed is technical knowledge on these subjects.

Mr. CALE. That is, as to the causes, I suppose, and the remedy?

Mr. ENGLEBRIGHT. Yes.

Mr. STEWART. That is the cause. The cave-in will come so rapidly upon them that they are killed before they know anything about it at all. They do not know even the explosive conditions in the earth which cause the cave-in, I am told.

Mr. LEE. The great trouble, though, is want of ventilation, is it not, in all mines?

Mr. STEWART. As far as the health in mining is concerned, that is essential.

Mr. LEE. But also in connection with explosions, I should think.

Mr. STEWART. Yes; that prevents explosions. Ventilation is everything. That applies to all mines. If you can get this bureau started it is going to do a great deal of good, and everybody will want it to be sustained, once it is started. It will have friends enough when it is known what can be done by means of the bureau. Start with it simply as a bureau. It will be a Department in time.

Mr. ENGLEBRIGHT. That is what one of the objections to starting the bureau is—that you get a wedge in and you want too much.

Mr. STEWART. If the Government assists the people, you can not do too much for the people. It is only when the Government runs for its own benefit that it is oppressive. If the Government can collect information that individuals can not afford to collect and that will benefit all, I believe that it is a good thing for the Government to do.

Mr. BARTLETT. I believe that the creation of the bureau will do away with the objection which is grounded on the fear that it will eventually become a Department, because the people will learn the conditions; they will be gradually educated and learn the usefulness of such a bureau, and see that it ought to be established.

Mr. LEE. It ought to be established.

Mr. FRENCH. I think that the very objection is a concession of its value.

Mr. STEWART. Yes; I am certain it will grow into a Department if it is created as a bureau.

Mr. ENGLEBRIGHT. If there are no further questions to be asked, we will adjourn.

Mr. BARTLETT. I am sure we heartily appreciate the Senator's talk here this morning.

(The committee thereupon adjourned.)

LETTER FROM THOMAS F. WALSH, OF WASHINGTON, D. C., FAVORING THE ESTABLISHMENT OF A BUREAU OF MINES AND MINING AND REFERRING TO THE IMPORTANCE OF THE DEVELOPMENT AND PRODUCTION OF THE RARER MINERALS, RADIUM, PLATINUM, VANADIUM, COLUMBITE, ETC.

SOME ADDITIONAL REASONS FOR THE ESTABLISHMENT OF A BUREAU OF MINES.

*To the Honorable Chairman and Members
of the House Committee on Mines and Mining.*

GENTLEMEN: In the hearings before your honorable committee on the question of the establishment of a bureau of mines, the fields of coal mining, iron mining, and precious-metal mining were well and ably covered by representatives of these respective industries, and the great benefits that a bureau of mines would confer upon them were pointed out in an able and intelligent manner. However, a great field of undeveloped mineral wealth, to which I beg to call your attention, was scarcely touched upon. I refer to the development and production of what is classed as the rarer minerals, such as radium, platinum, vanadium, uranium, tungsten, columbite, and others, all of which are much needed in our manufacturing and chemical industries.

Owing to a lack of knowledge of their properties and treatment, we are to-day producing practically none in America, but import them in large quantities from Europe at an expense of millions of dollars. Incredible as it seems, no effort has been or is being made to produce those valuable commodities of commerce. I believe we have them in paying quantities in the vast area of the mineralized portions of our country. More knowledge on this subject will prove that these little-known minerals are not as rare as they are supposed to be. Aluminum when first used was thought to be a scarce metal, yet when energetic efforts were directed toward its production it was found in quantities and in the common clays. I believe the same relative results will follow a thorough search for the rarer minerals. The proposed bureau, in its educational work in this particular line—by disseminating directly through the schools of mining, as well as through the public press, a knowledge as to how to recognize and find those minerals and how to treat and market them when found—would give such an impetus to its development and production as would probably result in an output of a new wealth greater than that of the precious minerals of to-day.

To give some idea of the great value of those minerals, I will, for illustration, take vanadium, one of the rarer of the economic class. As an alloy in the making of the highest grade of steel, vanadium is

the best ever discovered. It is the most prized ingredient the steel manufacturers can have. If it could be mined and sold at a reasonable price, our steel makers would gladly buy all that could be produced. As it is now, when they need it they have to import it from Europe and pay \$5 per pound, or \$10,000 per ton. The same is in a measure true of the other rarer minerals. There is a pressing and constant demand for them, but none is produced because it is a sphere of our mining activities that principally for the want of knowledge on the subject we have heretofore ignored, content to pay a great tribute to other nations for those things which we have at home.

Take another illustration—radium, the rarest of all minerals. Because of the small amount produced it has not yet passed from the scientific and physical to the economic. If we want an atom of it we must beg for it from the Austrian Government. Notwithstanding the small mineral area of that country, it has, because of its research work, a monopoly on it and its associated mineral, uranium. The production of the other rarer minerals will undoubtedly result in the production of radium, for we have reason to believe they go together. The dream of the ages has been the finding of perpetual motion. We seem to have it in radium. The proposed mining bureau, without interfering with its more utilitarian duties, can direct and foster the production of this most valuable mineral: it can investigate its properties and potentialities and, perhaps, apply it to the service of humanity in ways that will be as great in their benefits as radium is enduring.

It may be asked, can those rarer minerals be found in our country? I have the best of reasons for believing they can. Some prospecting recently made in this direction, in Colorado, promises good results. I have been over the mining districts of Bohemia, Austria, where many of them, especially uranium and radium, have been found. I have been over every mineralized State of our Union. So far as I could see we have the same conditions, the same character and class of baser minerals in which the rare ones are found. We have a mineralized area far greater than that of Europe, and in which we have found every mineral that we have heretofore searched for. The fact that we have not found certain ores is no evidence that they do not exist, but rather a proof that we have not looked for them. If it should be ascertained that, in accordance with our previous knowledge of the minerals and with their well-known affinity for each other, the rarer ones will be found associated with the baser ones in iron, zinc, copper and lead sulphides, then we are apt to find them in broad areas and in many unsuspected places—in the sulphide deposits of Virginia, the Carolinas, Georgia, Arkansas, and Missouri, as well as in the great mining States of the West.

An opinion prevailed that they would not be found in sulphides. But last year I had a piece of sulphide ore tested for radio activity and received a report that it possessed it in as strong a degree as the pitch-blend ore of Bohemia, which was conclusive proof of the presence of both uranium and radium.

Throughout our mining districts there are billions of tons of low-grade sulphide mineral on the dumps of mines awaiting the application of science to bring them into use. Whilst it can not be expected that all of these ores carry the rarer minerals, if they are found in a fraction of them the wealth they can be made to yield will be incalculable.

It may seem strange that this field of wealth should remain so long untouched, yet the explanation is simple. In mining, as in other things, we followed the line of least resistance, the course that with the simplest efforts led to the quickest and most direct results in the extraction and treatment of the ores—first, the rocker, then the sluice box, then the mill and smelter. We mined only the ores we could treat with these methods. If we noticed some strange mineral, which we often did, we either did not give it a thought or wished it well away because of its refractory influences in the treatment of the minerals we were after. This, as stated, was due to a want of knowledge of those rarer minerals and a consequent want of market for them, and this is why we are not producing any of them to-day, but instead paying out millions annually to Europe because we must have them. The importations will give but a faint idea of their enormous value to us, for if we were producing them ourselves our own industries would use a hundred times more than they do now. Their development and extraction will create a new industry that in turn will create new homes, new occupations, and new wealth for our own people. A great interest is awakening on this subject. Since I had the honor of addressing your committee I have had over a dozen letters asking for information and advice on every feature of the question. They are all of the same tenor. I will quote an extract from one, written from the southwest portion of New Mexico by a mining engineer:

I inclose a newspaper clipping and trust the bill referred to—the bill creating the bureau of mines—will soon become a law. It is one of the most needed enactments of the present day. I believe that radium and several other of the rarer minerals exist in this locality, but so little is known about them that the ordinary individual does not even know how they occur, much less how to extract nor where to get them treated. Please give me such information on the subject as will help me to look for and develop these ores.

The great national industry of mining is worthy of the same governmental encouragement and protection that is given the other industries, especially in the saving of life. The coal miner takes his life in his hands and toils all day in the darkened dusty caverns of the coal mines, looking forward with pleasure to the hour that will reunite him to his little family. It is only too often he is brought back in the cold stillness of death, the victim of an explosion, in most cases brought about by some hidden force of nature which is not yet understood. Surely, the lives of the vast army of these brave toilers should be the serious concern of the National Government.

The prospector, who braves the terrors of the snowy avalanche, climbs over precipitous rocks in high altitudes, in search of nature's treasures, is as much deserving of the nation's help as is his brother on the safe and tranquil farm.

Mining in all of its branches is worthy of recognition and help from our General Government, for the highest humanitarian and most important economic reasons. This it has not yet received. The time has come when the same beneficent helping hand that is given to agriculture should be extended to the more complicated and difficult industry of mining, for one is at least as necessary to the nation's prosperity as the other.

It has been asked under what head should the new bureau be placed? I believe that it should be placed in the Department of the Interior and be at least the coequal of all other bureaus. It should be under the direct control of the Secretary of the Interior. It should be com-

posed of the ablest experts that could be secured, men fully informed upon every feature of operative mining and who could advise with the Secretary upon the many perplexing questions relating to mineral interests and mineral lands.

The work of this mining bureau will be of the highest technical and scientific character. In no department of our Government will work of more importance be undertaken nor more beneficial and enduring results be accomplished. Through its well equipped laboratories and trained experts it will help to solve the perplexing problems now confronting and baffling the mine operators of our land; to stop the deplorable loss of human life now going sadly on, and to show us how to conserve and economize our mineral resources and guide and lead us to the development of greater wealth for the nation's enrichment. Year by year it will grow in importance and achievement and will be regarded with just confidence and pride by every American citizen.

I beg to remain, respectfully, yours,

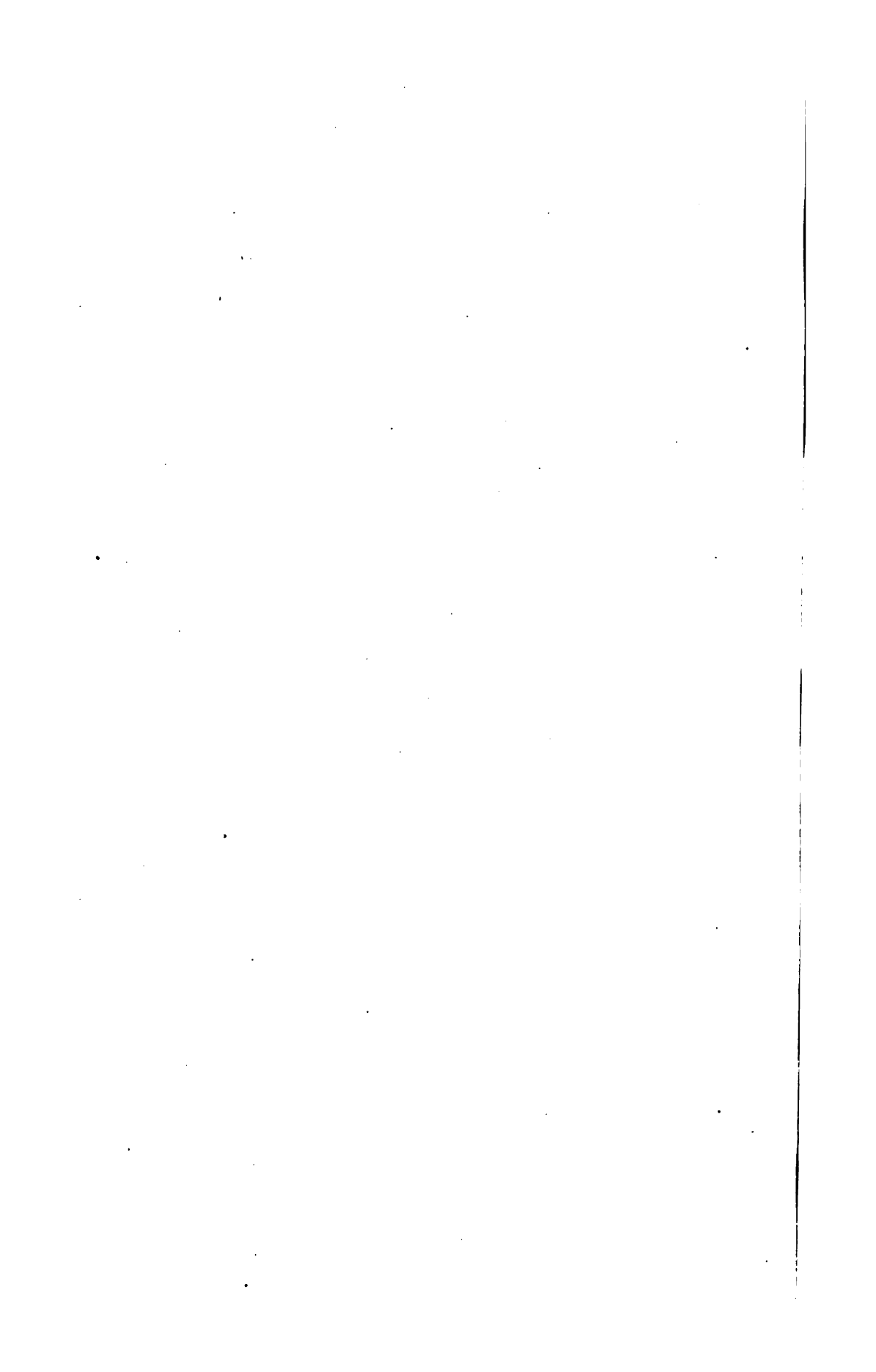
THOMAS F. WALSH.

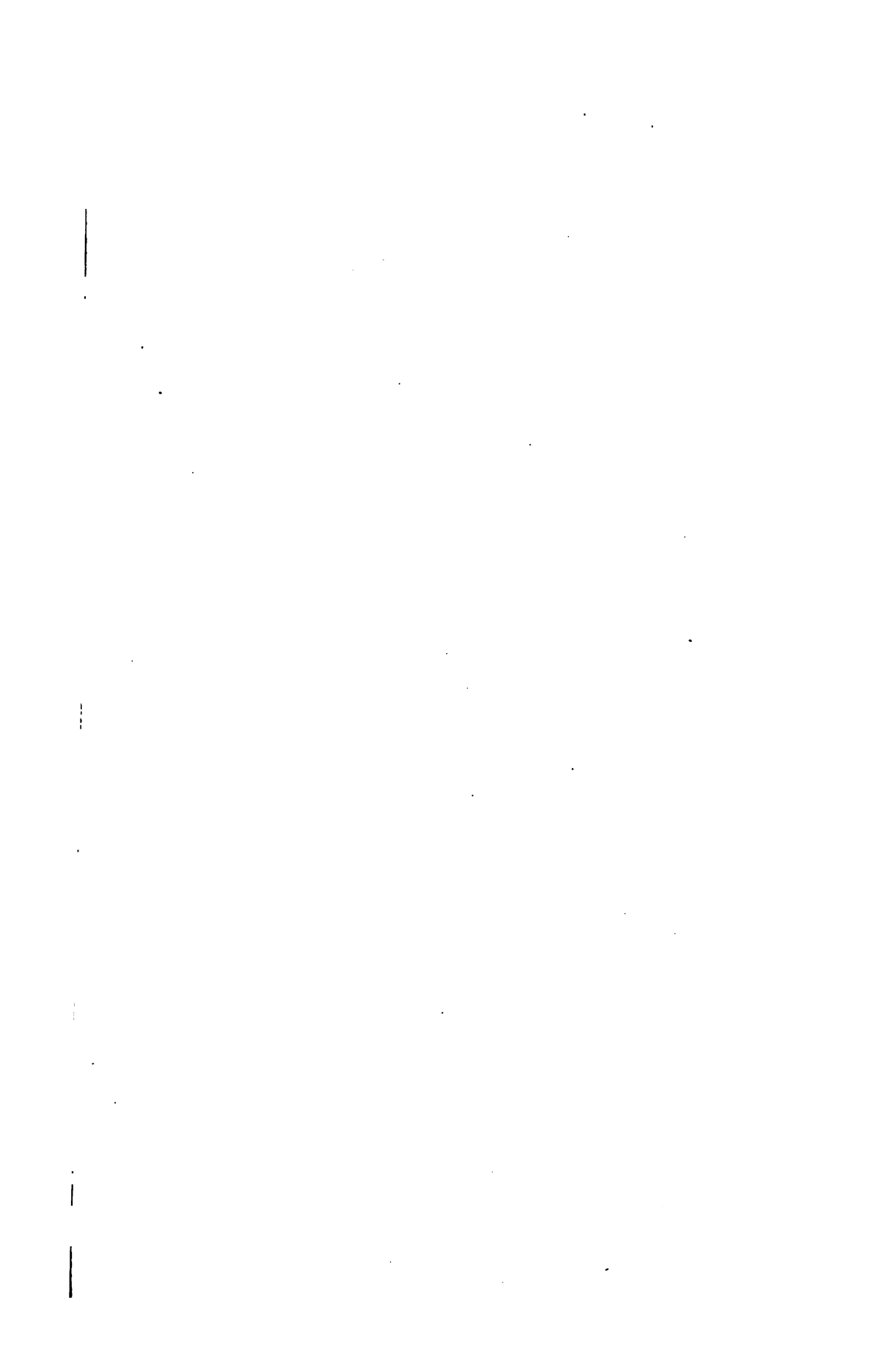
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